

THE IRON AGE

THURSDAY, JUNE 20, 1889.

Transmission of Power in Mining.

The cost of transmitting power through long distances to reach the point at which it has to be applied in mines has very often proved to be prohibitory of the adoption of mechanical agencies. A method has recently been tried with success at the Spring Hill (Nova Scotia) mines, which, under certain conditions, promises to overcome many of the costly difficulties arising both from excessive friction in some cases of applying power and from leakage in others. The depth below the surface at

may be of ready application, and its simplicity and economy in such cases can hardly fail to recommend its adoption. It would probably be found in practice that 600 feet perpendicular need not be held as the limit of depth at which such a system could be economically applied.

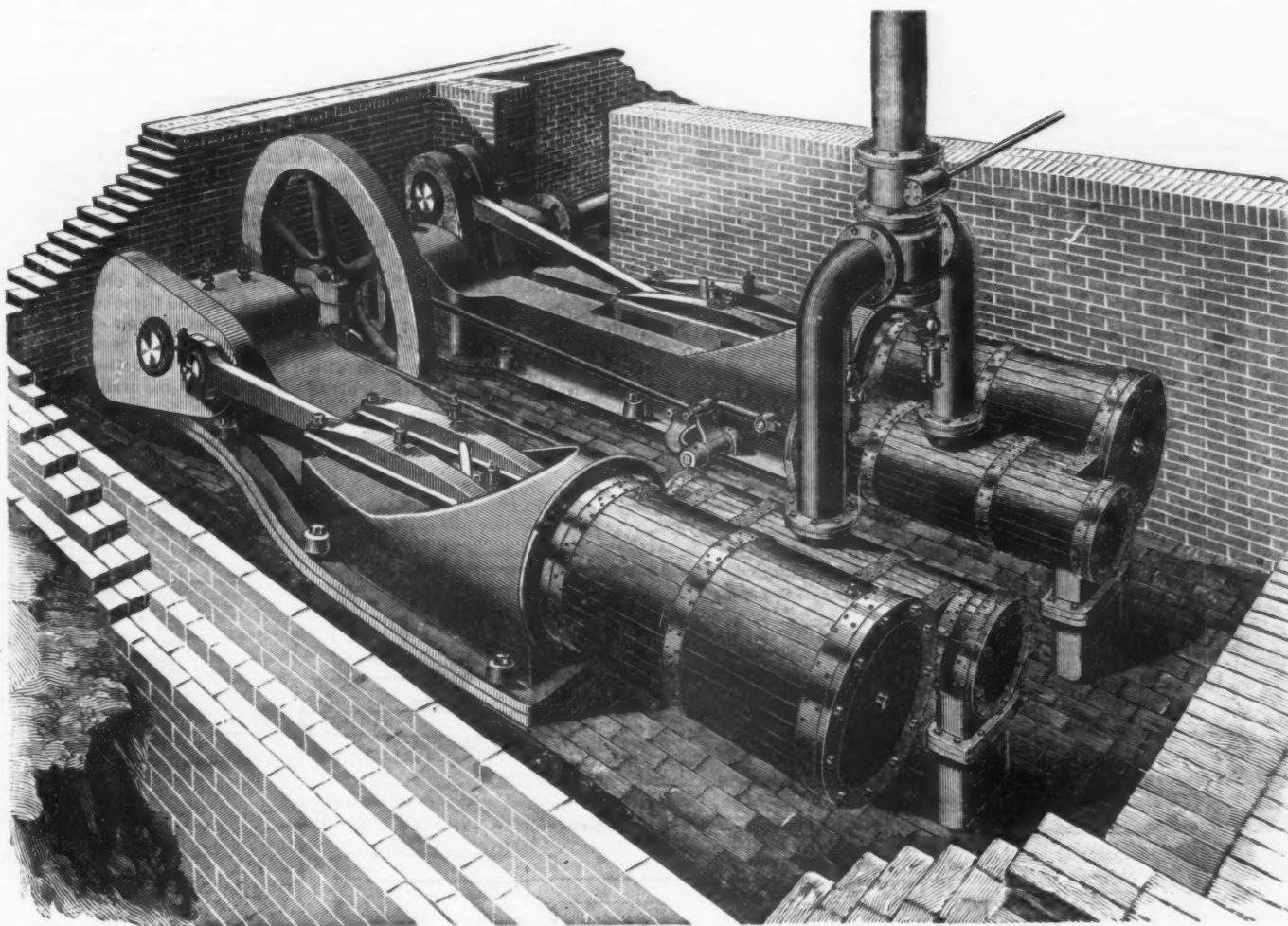
Canada's Iron Production in 1888.

Advance sheets of the annual report of Mr. E. Costa, in charge of the Mineral Statistics Division of the Geological Survey of Canada, give the following state-

was \$16,500,000, as against \$12,959,073 in 1887, but in reality \$1,847,102 of this increase is a miscellaneous item not included in last year's returns.

The Latrobe Steel-Works Engines.

We here present illustrations of the engines for the tire mill of the Latrobe Steel Works, of Latrobe, Pa. These engines were designed and built by William Tod & Co., of Youngstown, Ohio, in accordance with the general specifications of



THE LATROBE STEEL-WORKS ENGINES, BUILT BY WILLIAM TOD & COMPANY.

the point where the power was required to be applied being but 600 feet, a bore of 4 inches in diameter was made directly above that point, and an endless wire rope being lowered through it and passed over a pulley at the bottom, the power of a steam-engine at the ground level was by this means transmitted directly to the workings below. It had been calculated that the cost of this bore-hole would be considerably less than the prime cost of the 1800 feet of steam-pipe which would have been required to reach the working point, while loss by leakage and repairs required to such a length of suspended piping were further saved. The diameter given to the bore is said to be ample for the rope to work without friction, as also to admit of a signal rope being placed with it to enable the workmen in the mine to communicate with the driver of the engine above. There are many cases where this novel method

may be of ready application, and its simplicity and economy in such cases can hardly fail to recommend its adoption. It would probably be found in practice that 600 feet perpendicular need not be held as the limit of depth at which such a system could be economically applied.

	Tons (2000 pounds).	Value.
Iron ore.....	44,410	\$139,393
Pig-iron.....	18,191	226,443
Rolled and forged iron	40,962	1,442,974
Steel.....	9,508	470,819

The production of iron ore has fallen off in recent years, it is said, on account of the presence of sulphur in the ore, rendering it in a measure unmarketable. This is particularly true of the Coe Hill mines, owned largely by Americans. The statement as to the production of rolled and forged iron includes four rolling-mills, one forge and the Londonderry Iron Works, but returns have not yet been received from six similar works. The total manufacture of iron will, however, be much larger than that of last year. Nominally, the value of all Canadian mineral products for 1888

was \$16,500,000, as against \$12,959,073 in 1887, but in reality \$1,847,102 of this increase is a miscellaneous item not included in last year's returns.

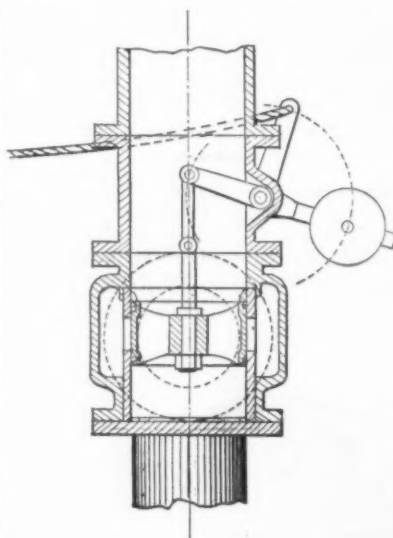
Julian Kennedy, chief engineer of the Latrobe Steel Works. As the work requires frequent stopping and starting it was necessary to use coupled engines, and as direct connection was desired one of the engines is made center-crank. The beds are of the Porter type, similar to that of the Porter-Hamilton engine as made by the builders. The valves are of the piston type, with large and direct steam openings, and have a travel of 6 inches. The cylinders are placed 8 feet 8 inches between centers, and are 26 inches in diameter, the stroke being 42 inches. The shaft is 12 inches in diameter, and the fly-wheel 8 feet in diameter. The admission of steam is controlled by a single-piston throttle-valve, which we show in section in the small drawing. The large drawing shows clearly the form and arrangement of the principal parts of the engine.

The Industries of Southwest Virginia.

In a letter to the *Manufacturers' Record* Mr. Chas. G. Eddy, of Roanoke, who, as vice-president of the Norfolk and Western Railroad, has done so much for the advancement of Southwest Virginia, writes as follows:

There has never been established upon our line a manufacture that has not prospered, and the developments in the next 12 months will be as remarkable as anything in the past. We desire no "boom;" we want manufactures. Steady, honest, successful growth has been displayed by the city of Roanoke in the last seven years, jumping from a village of 450 people to a city of 15,000 population. It has the finest water-works system in the State, gas-works and electric plant; street railway now being built; locomotive and car works employing from 900 to 1000 men; rolling-mill manufacturing bar-iron, angle-iron, bridge iron and small rails, employing from 150 to 200 men; the American Bridge and Iron Works, now just being completed, for the manufacture of iron bridges, blast-furnaces, &c.; the Crozer Steel and Iron Company, with one large coke iron furnace (which has been in operation over six years) and a duplicate of the same now being erected, which will give them an output of 300 tons of pig-iron per day; basic steel plant projected which will have a capacity of 15 to 20 tons of basic steel per day, to be converted into steel plates of all descriptions, but looking forward especially to furnishing steel plates to ships at Norfolk, the Virginia navy-yard that will eventually be able to build ships using only material

Ivanhoe, on the Cripple Creek line, a furnace has been in operation only six months, and most successfully. And so on to the State line at Bristol is found an unlimited supply of ore, backed by the best coke in the world—the Pocahontas or Flat Top.

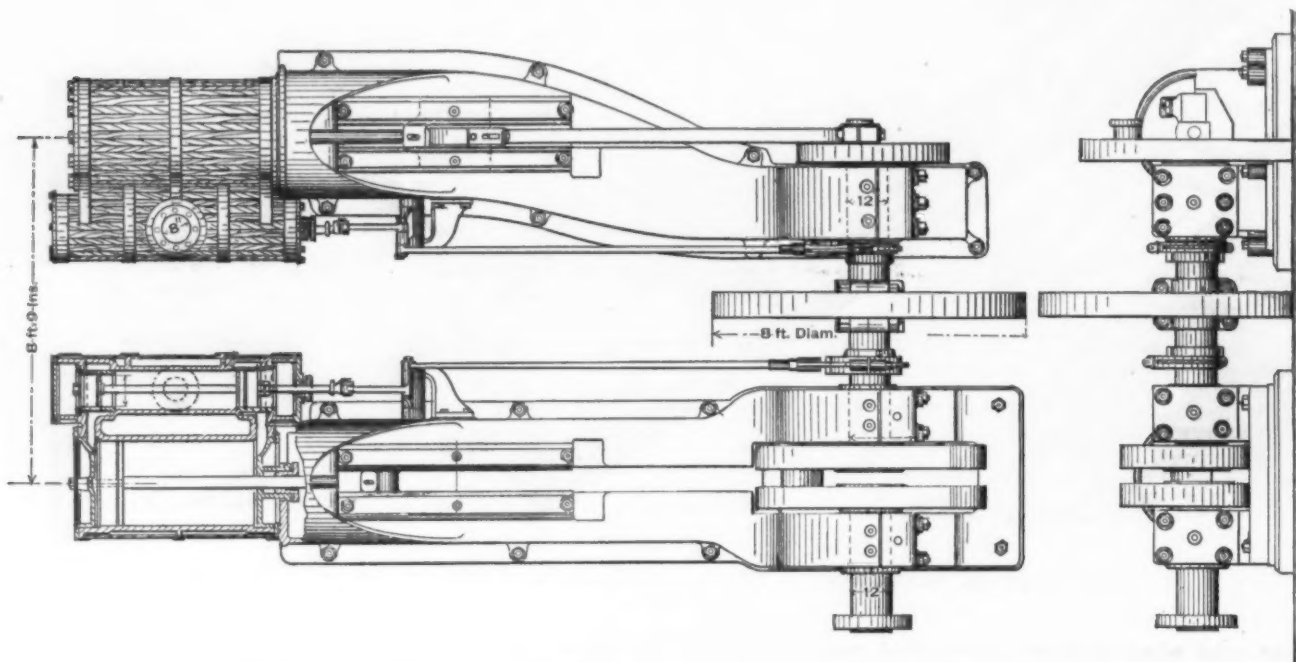


Single-Piston Throttle-Valve.

Then passing on to our Clinch Valley line, which is to connect us with the Louisville and Nashville system through Cumberland Gap, the development of iron ore, coal, barytes and other minerals has been most extraordinary up to the present

grounds will comprise 45 acres, and there will be exhibited railway rolling-stock and railway appliances, electric light, power and other electrical devices, and all kinds of implements, tools, &c. The buildings and grounds will be opened for the reception of articles from the 5th of August. Some facts are stated by the association which are of interest. They say that St. Joseph is in the geographical center of the United States, being 1400 miles from Boston, 1400 from San Francisco, 700 from Galveston and 700 from the north line of the United States. It is in the center of the territory comprising the four great States of Kansas, Nebraska, Iowa and Missouri, claimed to be "the richest country in natural resources on the face of the earth." Within a radius of 200 miles from St. Joseph there is a population of 4,000,000 people, while the city itself contains 75,000. The fruit and agricultural display will undoubtedly be one of the finest ever made, owing to the richness of the agricultural section in which the city is located.

Chilled Slide-Valves. — *L'Ingenieur-Conseil* states that M. Bollinckx is casting the valves of Rider engines in a mold which chills the faces. The chill penetrates to a depth of $\frac{1}{4}$ inch to $\frac{1}{2}$ inch. As the surface cannot be cut with a tool, it is ground with emery rollers until a perfect true and polished face is obtained. It is claimed that not only do these surfaces not wear, but that, thanks to their exceeding smoothness, they do not wear the faces on which they work. Further, the coefficient of friction is naturally very



THE LATROBE STEEL-WORKS ENGINES.—SECTIONAL-PLAN VIEW AND END ELEVATION.

manufactured from the products of the mines and mills in Virginia; an additional iron furnace projected, which will probably be built within the next 12 months. The development of iron-ore properties within 20 miles of Roanoke in the past year has been unparalleled in the history of Virginia mines.

Passing on to Radford, there are two furnaces projected at that point, which will in all probability be built this year. At Pulaski is the Pulaski Iron Company's furnace, which has been more successful than any other furnace in the South, and has only been in operation one year; there are ten zinc furnaces at that point and additional furnaces projected. At

time, and will be exceeded as the prospecting goes on. I claim that Southwest Virginia is the best district for successful manufacturing in the United States, not excepting the Birmingham district.

The National Railway, Electrical and Industrial Exposition Association, of St. Joseph, Mo., will hold an exposition at that place this fall, commencing on the 3d of September and closing on the 5th of October. Every effort will be made to have this exposition attain a standing of national importance. The main building for machinery and other exhibits will have a floor space of 80 x 1040 feet. The amphitheater will seat 10,000 people. The

small. The administration of the State railways has sent a representative to examine the application of the mode of construction to the slide-valves of locomotives. The plan of chilling the slide-valves of engines has been tried in this country on a small scale, and has been found to work well.

The leading railroad lines from Chicago agreed to a reduction in rates on iron bound eastward, to correspond with the cut on west-bound shipments. The rate to Buffalo is reduced from \$2.50 to \$2.20 a ton; to Cleveland, from \$2 to \$1.60; to Detroit and Toledo, from \$1.70 to \$1.40, and so on.

Use of Softeners in Foundry Practice.

By WALTER GRAHAM, BELLEFONTE, PA.

When the furnace of the Bellefonte Furnace Company, at Bellefonte, Pa., went into blast, owing to the irregularity of the silicious hematite ores and of the limestone used, a small amount of pig-iron, containing from 3 to 6 per cent. of silicon, was made before the stock and burden could be regulated. This iron contained of combined carbon 0.25 per cent.; graphitic carbon, 3 per cent.; total carbon, 3.25 per cent.; silicon, 3 to 6 per cent.; phosphorus, 0.35 per cent.; sulphur, 0.02 per cent.; manganese, 0.50 per cent. The iron containing the highest percentage of silicon was quite light in color, and was readily disposed of as silvery or carbonized iron. The lower silicon iron was not wanted, because it was, "strictly speaking, not a carbonized iron," or because it was not well-grained No. 1 and No. 2 foundry iron; "iron being bought from its fracture and not from analysis," as we were informed. This iron has been graded from analyses, according to its percentage of silicon, as No. 1 soft and No. 2 soft foundry iron. It has little or no grain and is very soft under the drill or chisel. At 3.25 per cent. silicon the iron is dark, growing lighter in color as the silicon is increased. No. 1 soft contains 3.25 per cent. silicon and is dark with some grain. No. 2 soft contains 3.50 to 4 per cent. silicon and is dark and close-grained. With the easily reduced silicon hematites of the Buffalo Run Valley, containing iron 35 to 50 per cent.; silica, 18 to 40 per cent.; sulphur, 0.02 to 0.04 per cent.; phosphorus, 0.08 to 0.16 per cent., and manganese, 0.50 to 0.70 per cent., these two grades of iron can be readily made when the furnace is on No. 1 foundry iron by an increase in the temperature of the furnace, produced from a variation of 50 pounds in the burden and an increase of 2 per cent. of silica in the cinder.

I was convinced from its analysis that this iron would prove most useful in foundry work, and, for reasons to be stated further on, believed it to be an ideal softener. I tried to explain to several foundrymen, in chemical terms, how it could be used to advantage. My explanation of the proportions of chemical elements in the iron and their effect when remelted with other irons was generally interrupted with the remark that "they were not chemists, and so did not understand that sort of thing." "Their experience had, as a rule, been that an iron that was well grained out to the edge of the pig was a soft, strong iron, and for such an iron, when they found it to suit their purpose, they did not mind paying an extra dollar a ton." The experience of intelligent consumers of pig-iron cannot be neglected, and men who pay an extra price for an iron for a special purpose must have satisfied themselves that it is worth the money. An experience of several years in the laboratory and steel-works of one of the largest steel companies in the country and the subsequent charge of two little Bessemer plants led me to believe, however, that chemical analysis is the best guide that we have for the use and manufacture of iron in any form.

Recently I went to the shop of one of the foundrymen spoken of above to examine a broken casting. Pieces of a very hard and brittle pulley were shown me, and I observed on a lathe a pulley of the same pattern that had been on the lathe all day and was not yet turned up. After seeing their iron and scrap pile, I asked them to let me send them a few tons of the high-silicon and low-phosphorus iron described above. They cast from it a strong, soft pulley that was machined in three hours. They gave an order for two

cars of this iron, to be delivered at once, and although the grain of the iron was not open, they declared themselves satisfied. Since then they have used it in various proportions. A spur-wheel containing 1800 pounds charcoal iron and 1800 pounds No. 2 soft Bellefonte gave unusual strength and softness.

In many foundries nothing is known of the chemical elements in the irons used by them or in the castings made, and they have no chemical standards or formulas for the different classes of castings; their only guide in purchasing and using pig-iron being the fracture. Such practice seems to be very much behind the age of steel, but it prevailed in the age of iron, and still greatly prevails among the users of pig-iron. Pig-irons containing the same amounts of combined carbon and graphitic carbon and other elements may have different fractures, and irons having different fractures may contain the same amounts of the chemical elements that affect the quality of the iron.

Close-grained iron is found in the same cast as opened-grained iron. Foundry iron run rapidly from the furnace will usually have an open grain, while iron which is allowed to run slowly will have a close grain. In either case the iron only differs in appearance, even the amounts of graphitic and combined carbon being practically the same. Were iron bought and sold on analysis this would become evident.

Professor Turner says: "There is a suitable proportion for each constituent present in cast-iron. This proportion depends upon the character of the product which is desired and upon the proportions of the other elements present." The neglect of this law is the reason why two or three high-grade and costly irons melted together may give weak castings. It is by careful attention to the mixing of low-grade irons, scrap and high-silicon irons, so that the proper proportion of each constituent is produced, that strong castings are made from what was considered inferior material.

The knowledge of the effect of the several elements, carbon, silicon, manganese, phosphorus and sulphur, on cast-iron would be most valuable to foundry men, as by it they might save the extra dollar spoken of above paid for an imported or well-known brand to insure them in getting the proper proportion of the constituents ready made. They would also save many extra dollars thrown away on worthless castings and time wasted in machining iron that is too hard. They could use more low-grade irons and scrap, and having an exact and scientific language in which to communicate their wants to the furnace men they would receive what they are in search of.

This need of a common language, so to speak, between the producers and users of pig-iron has been frequently urged. As the best literature on the subject deals with the chemical analyses of iron and valuable deductions and conclusions have been drawn from them, the knowledge and use of a few chemical terms seem necessary in an intelligent discussion of the qualities of iron.

The labors of Mr. W. J. Keep, of Detroit, and others recently; the experiments and conclusions of Colonel Caron, of France; Professor Turner, of England; M. Ferd. Gautier, of Paris, and other European writers on the qualities of cast-iron, have been republished in our trade journals. These, with Mr. Keep's and his associates' experiments and the discussions to which they have given rise, have opened to all in this country the scientific treatment of the subject. The following are some of the most recent and accessible papers and discussions that are useful to those interested in the manufacture and use of pig-iron:

"The Constitution of Cast-Iron," Professor Turner, England; "Silicon in

Foundry Iron," M. Ferd. Gautier, Paris. The papers of Mr. W. J. Keep and his associates, Mr. H. S. Fleming, Prof. C. F. Mabery, Mr. L. D. Vorce and Mr. Ed. Orton in *The Iron Age* and *Journal of Charcoal Iron Workers*. The contributions of Messrs. C. A. Meissner, A. E. Hammer, E. S. Cook, S. H. Chauvenet and J. Birkenbine, to *The Iron Age*. In the *Journal of the British Iron and Steel Institute*, by Messrs. Ed. Riley, Thos. Turner, I. L. Bell, Dr. Percy, Prof. Miller, Chas. Wood, Sir Fred. Abel, Sir W. Fairbairns and others. The above, which occur to me as I write, and many more which I need not name, give much information, which when read in connection with the practical knowledge of iron obtained in the foundry and shops will prove of great value commercially.

Going further into the subject, the researches of Herr Martens, Dr. Herman Wedding, Mr. F. Linwood Garrison, Dr. H. C. Sorby and others, in the microscopic structure of iron and steel, are of great interest. To those who read German, the papers and discussions in *Stahl und Eisen* and the works of Akerman, Karsten, Ledebur, Mueller, Von Tunner, Wachler, Wedding and others will present themselves. While the above list is familiar to many readers of *The Iron Age*, I have found that many to whom the above discussions might prove of value in dollars and cents in their business consider that they are only matters concerning chemists, and so remain ignorant, or very nearly so, of what concerns themselves.

Although there is much that is fragmentary and conjectural written about cast-iron, yet there have been conclusions drawn and clearly stated that have been applied in the most wide-awake foundries and mills to their profit. They have fallen into line with the steel-works and furnaces supplying steel-works, and are operating understandingly on a scientific basis. It remains for the iron trade generally to adopt standards and chemical formulas and an exact language in common to express their wants. The subject of softeners has been treated upon largely by the writers referred to, and the use of Scotch pig or imitation of Scotch pig, containing, generally, high silicon, phosphorus and manganese and of ferro-silicons containing very high percentages of silicon and low carbon, is becoming more and more frequent. It may be well to state broadly the effect, as now understood, of the elements carbon, silicon, phosphorus, manganese and sulphur on iron and on each other when present in iron.

CARBON.

Carbon being considered the most important of the constituents of cast-iron comes first in the list. Professor Turner takes as a standard the average British cast-iron, which contains 3.4 per cent. of total carbon. One of the best brands of foundry iron in our market contains of silicon, 2.43 per cent.; phosphorus, 0.34 per cent.; sulphur, 0.02 per cent.; manganese, 0.24 per cent.; combined carbon, 0.40 per cent.; graphitic carbon, 3.12 per cent.; total carbon, 3.52 per cent. Bellefonte No. 1 foundry iron contains of silicon, 2.60 per cent.; phosphorus, 0.35 per cent.; sulphur, 0.03 per cent.; manganese, 0.50 per cent.; combined carbon, 0.30 per cent.; graphitic carbon, 3.18 per cent.; total carbon, 3.48 per cent. Carbon exists in cast-iron as combined carbon and graphitic carbon. In the molten state the metal is supposed to contain carbon as combined carbon or carbide of iron. The strength of irons low in phosphorus and sulphur depends upon the proper proportion of combined carbon and graphitic carbon.

COMBINED CARBON.

Combined carbon in cast-iron increases its hardness and brittleness. Metal that

contains much combined carbon shrinks more in cooling than metal containing its carbon in the graphitic state. Sudden cooling of metal prevents the separation of carbon as graphite, and retains it in the state of combination with the iron. Successive remelting of iron increases the amount of combined carbon. Carbon discovered that combined carbon is replaced by silicon. Gautier and Akerman conclude that combined carbon is replaced by silicon, and the carbon, being separated from the iron, is precipitated as graphite; therefore silicon added to iron produces graphite, and when silicon is taken from iron combined carbon is formed. Irons low in silicon generally contain much combined carbon.

The presence of sulphur or manganese promotes the formation of combined carbon, as they act in a contrary direction to silicon. So "any required proportion of combined carbon may be obtained by altering the amount of silicon on one hand and the amount of manganese and sulphur on the other." Small variations in the amount of combined carbon are important. Professor Turner gives 0.40 per cent. of combined carbon as the figure at which the maximum general strength is obtained. "The metal being sufficiently soft to work with a tool and the crushing and tensile strengths being high." His conclusions as to the best proportions for the constituents of cast-iron are drawn from the Woolwich experiments.

GRAPHITIC CARBON.

Carbon existing as graphite in cast-iron makes it soft and tough. Mr. F. L. Garrison observed under the microscope that strong iron contained graphite in an irregular mass of fine black lines, evenly distributed throughout the mass. In the weaker irons the graphite was in irregular and somewhat isolated patches of comparatively large size, and without any regular grouping. When the constituents are in the proper proportion and the metal not suddenly chilled, the change of carbon from the combined to the graphitic state occurs at the instant of crystallization, which causes the carbon thus liberated to be distributed uniformly throughout the mass of metal, thus preventing these weakening spots.

Professor Turner deduces from the Woolwich experiments for crushing strength that graphite should be under 2.6 per cent.; for general strength it should be about 2.8 per cent.; for strength and softness it should be about 3 per cent.; for softness it should be over 3.10 per cent, when the total carbon is 3.4 per cent.

(To be continued.)

A need of better facilities for the handling of supplies and products in large manufacturing establishments has led to the adoption of tramway cars propelled by electric motors. A greater part of the large mills being supplied with electric-light systems renders this an easy matter, and it is safe to predict that before long the electric tramway will come to be considered a necessary feature in mill equipment. The Thomson-Houston Electric Company have already equipped several tramways and have contracted for others which will soon be put in operation. The tramway car at the company's works in Lynn is used for carrying heavy machinery to different parts of the factory, and its use permits the handling of apparatus with much greater ease in less time and with less labor than could possibly be accomplished by any other method. The car is equipped with two 3 horse-power motors, and easily carries up a grade of 13 per cent. a load of 5 tons, while from 8 to 10 tons can be carried on a level. The motors receive their current through an overhead wire from one of the generators in the factory.

THE ENGINEERS ABROAD.

(Editorial Correspondence.)

The greater number of the party of American engineers who joined the excursion to England and France left New York on the City of Richmond, Saturday, May 25, steaming down the harbor amid the cheers and farewell salutes of numerous friends. As soon as the high seas were reached it became evident that high attainments in steam engineering, iron-smelting, mining or machine construction are by no means a guarantee against the discomforts caused by an unstable equilibrium, although woeful countenances were generally explained by the grief occasioned by departure from home and friends. A few days of smooth sailing, as comfortable as a trip on a new boat, brought smiles to tearful countenances and appetites to the most dyspeptic. The engineers and their ladies whiled away the intervals between meals, the four great events of the day, as best suited their tastes. Special efforts were generally made to make the evenings memorable; a dance, a concert, an initiation into the Order of Neptune following one another in rapid succession. To a number of the members of the party frequent committee meetings caused additional diversion, the object being to arrange for a provisional organization. Subject to confirmation by the party on the City of New York, the following joint committee was appointed:

Henry R. Towne, of Stamford, Conn., president; S. J. Whittemore, O. Chanute, C. J. H. Woodbury, of Boston; Alfred E. Hunt, of Pittsburgh, Pa.; S. W. Baldwin, agent Pennsylvania Steel Company at New York; John T. Hawkins, Campbell Printing Press Company, of Taunton, Mass.; Oberlin Smith, Ferracute Machine Company, Bridgeton, N. J.; Alexander Dempster, W. H. Wiley, of New York; William Forsyth, C., B. and Q. Railroad, Aurora, Ill.; Herbert G. Terry, U. S. Assay Office, New York; C. E. Emery, New York Steam Heating Company, New York; C. Kirchhoff, Jr., editor *The Iron Age*, secretary.

Just before departing invitations were received from a committee of Liverpool engineers to take part in one of two excursions arranged for Thursday, the day following the probable date of arrival of the City of Richmond. One of these excursions is to be conducted under the auspices of the Liverpool Dock Estates Trust, and the other is to visit the famous ship-building yards of Laird Brothers, at Birkenhead, opposite Liverpool, going from there to the pumping and ventilating plant of the great Mersey Tunnel. In the evening a reception is to be held at the Liverpool Town Hall by the mayor of the city. On Friday the members divide into a number of groups who will spend the Whitsuntide holidays amid the mountains of Wales or the charming lake region.

It is only natural, since the trip was originated by the American Society of Mechanical Engineers and was principally pushed by the officers of that body, that the greater number of gentlemen in the party are identified with it. Among those who sailed on the City of Richmond are: Robert Allison, of the Franklin Iron Works, Port Carbon, Pa.; D. L. Barnes, consulting engineer, of Chicago, who has lately designed steel cars for the Illinois Steel Company; G. H. Barrus, of Boston, Mass.; W. H. Baldwin, manufacturer of bolts and nuts at Youngstown, Ohio; S. W. Baldwin, of the Pennsylvania Steel Company; C. S. Beach, Bennington, Vt.; M. A. Beck, Chicago, Ill.; Jerome L. Boyer, Chestnut Hill Iron Ore Company, Reading, Pa.; Morgan Brooks, St. Paul Gas Light Company; W. D. Caldwell, cot-

ton manufacturer, Nashua, N. H.; F. A. Canfield, of Dover, prominently connected with New Jersey iron ore interests; R. E. Curtis, Newburyport, Mass.; C. M. Collins, of Studebaker Brothers, South Bend, Ind.; James Christie, chief engineer Pen-coyd Iron Works, Philadelphia; F. H. Daniels, Washburn & Moen Mfg. Company, Worcester, Mass.; E. V. D'Inville, of the Second Geological Survey of Pennsylvania; Fred. P. Dewey, curator of metallurgy, National Museum, Washington, D. C.; W. V. Fairbairn, chief boiler inspector of Massachusetts; Robert Fraser, mining engineer, of Philadelphia; Edward O. Goss, Scovill Mfg. Co., Waterbury, Conn.; George A. Gray, manufacturer of tools, Cincinnati; G. N. Hewitt, Aspen, Col.; O. S. Harmon, of Brooklyn, who is connected with the Lorillards, of Jersey City; William Hill, Collins Company, Collinsville, Conn.; H. D. Hibbard, steel melter, of Pittsburgh, Pa.; Edwin T. Howard, fire-brick manufacturer, of St. Louis; Chas. E. Hyde, of Bath, Maine, who is interested in marine engineering and ship-building; Frank E. Kirby, who is similarly engaged at Detroit, Mich.; Profs. D. S. Jacobus, of the Stevens Institute of Technology; W. T. Magruder, of Vanderbilt University, Tenn.; G. T. Alden, of the Worcester Polytechnic Institute; Allyn L. Merrill, Edward T. Miller and Peter Schwamb, of the Massachusetts Institute of Technology; F. F. Sharpless, of the Michigan Mining School; E. P. Jennings, of Stambaugh, Mich.; William Kent, of the Springer Torsion Balance Company, Jersey City, N. J.; Chas. Kirchhoff, Jr., editor *The Iron Age*, New York; G. Lavagnino, engineer of the Old Telegraph Mine, Salt Lake City, Utah; Edwin Mickle, Thomas Iron Company, Hokendauqua, Pa.; E. H. Mumford, Union Pacific Railroad, Leavenworth; Edward Melvain, manufacturer of plate iron, Reading, Pa.; F. P. Grosvenor MacLean, United States Patent Office, Washington, D. C.; Edward Nichols, Brooks Locomotive Works, Dunkirk, N. Y.; John D. Ormrod, Donaldson Iron Company, Emaus, Pa.; Edgar Richards, chemist United States Treasury Department, Washington, D. C.; T. H. Roberts, Grand Trunk Railway, Detroit, Mich.; D. W. Robb, Amherst, Nova Scotia; T. A. Robinson, Illinois Steel Company, Joliet, Ill.; Walter S. Russell, Russell Wheel and Foundry Company, Detroit, Mich.; Newell Sanders, Chattanooga Plow Company, Chattanooga, Tenn.; T. Jackson Shaw, ship-builder, Wilmington, Del.; Oberlin Smith, Ferracute Machine Company, Bridgeton, N. J.; G. R. Stetson, superintendent Morse Twist Drill Machine Company, New Bedford, Mass.; A. A. Stevenson, Standard Steel Works, Lewistown, Pa.; H. H. Supplee, editor *Mechanics*, Philadelphia; Ambrose Swasey, of Warner & Swasey, Cleveland, Ohio; J. Archie Taylor, Pusey & Jones Company, Wilmington, Del.; James A. Tilden, Hersey Meter Company, Boston, Mass.; E. A. Uehling, superintendent of blast-furnaces of Bethlehem Iron Company; F. H. Underwood, manufacturer of belting, Tolland, Conn.; Baxter D. Whitney, manufacturer of wood-working machinery, Winchendon, Mass.; W. C. Williamson, engine builder, Philadelphia, Pa.; James Wister, iron merchant, Philadelphia; Walter Wood, of W. D. Wood & Sons, manufacturers of cast-iron pipe and gas works, Philadelphia; Maunsell White, Bethlehem Iron Company, Bethlehem, Pa.; C. J. H. Woodbury, consulting engineer of the Manufacturers' Mutual Insurance Company, Boston, Mass.; Horace Wyman, manager machine works, Worcester, Mass., and H. Winfield Wyman, manufacturer of forgings, from the same city.

It will be seen that there is quite a representative body of engineers, the greater

majority of whom are members of the American Society of Mechanical Engineers, while there is a fair number of members of the American Institute of Mining Engineers. An additional number of both bodies follow on the City of New York, which, however, contains in its passenger list nearly all the members of the American Society of Civil Engineers who accepted the invitation of their English hosts.

Belt Strapping Machine.

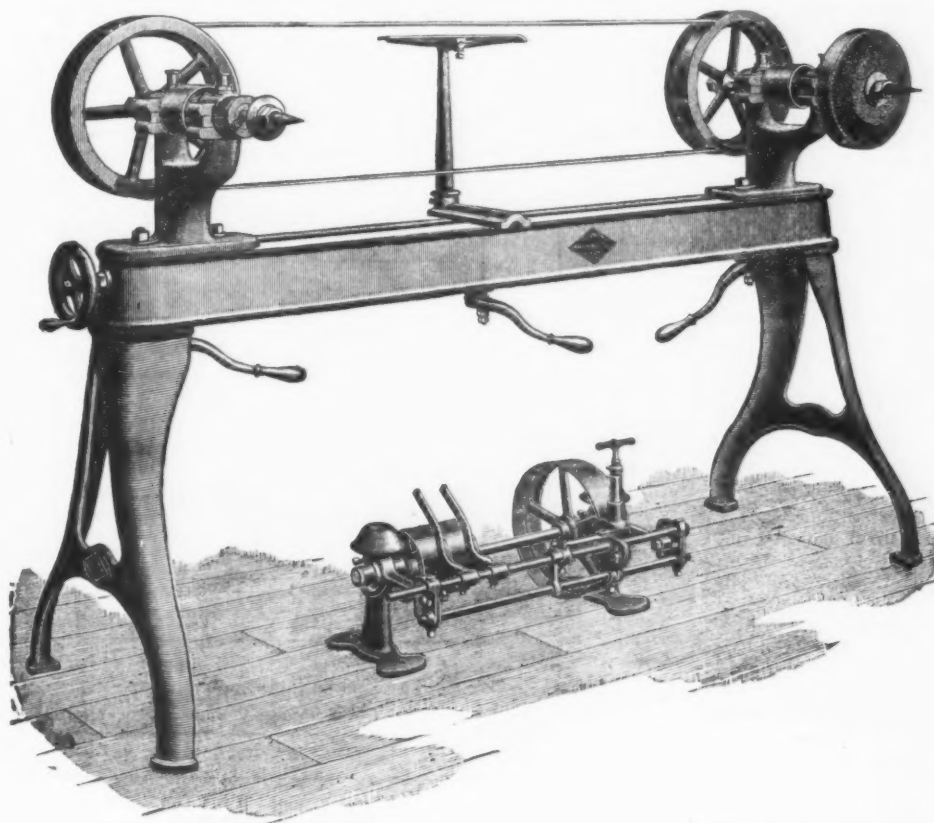
This machine is built for the purpose of running belts covered with emery, for strapping and polishing. It consists of a rigid bed, upon which are clamped two heads, each having a steel spindle carrying a driving-pulley between the bearings, and a flange-pulley close on the outside. A hand-wheel at one end of the bed

This machine is made by the Diamond Machine Company, of Providence, R. I., and Chicago, Ill.

Judge Thayer's Railroad Decision.

The opinion of Chicago railroad men is greatly divided on Judge Thayer's decision. Some consider it the beginning and the end of the Interstate Commerce act, or of a revolution in the existing state of affairs. Chairman Walker, of the Interstate Commerce Railway Association, and until March a member of the Interstate Commerce Commission, spoke freely on the subject. Said he: "The decision is, I think, an extremely important one. Contrary to most of the reports, Judge Thayer did not say, however, that the through rates should be the sum of the locals. On the other hand, although he does not say in so many words that there should be a

sult a state of affairs which would revolutionize business and bankrupt the Western grain-raising States. No grain could be moved from the interior to the seaboard. It is not likely that this state of affairs will come to pass, but it might. This case being a criminal one, it may be appealed from the district court where it was tried. If then the circuit court judges agree there is no further appeal. As far as regards this case, I believe it can be easily defeated. The defendant, Tazer, or, more properly, the Missouri Pacific road, was found guilty of discriminating against the Hayward Grocery Company, the shippers in both cases. The through barrel of sugar, which was shipped from Chicago, cost 34 cents per 100 from Hannibal to Hepler, and the local barrel cost 46 cents per 100 between the same places. The very fact that the shipper was one and the same in both



THE DIAMOND BELT STRAPPING MACHINE.

operates a square-thread screw for drawing one of the heads along the bed to secure the proper tension for the belt. To facilitate the changing of belts the other head is provided with a handle whereby it can be pushed quickly along the bed. Each head is clamped by a lever and cam, as shown, and a slight movement is sufficient to release or tighten it. One spindle is provided with the regular arrangement for carrying leather-covered or cloth wheels on the end opposite the flange-pulley. Two adjustable rests are furnished for different varieties of work, one being used under the lower belt, the other under the upper one. The machine is heavy, well proportioned, and arranged to run at a high rate of speed. The most important measurements are as follows: Length of bed, 6 feet; height from floor to center of spindle, 39 inches; size of flange-pulley furnished, 12 x 2½ inches; length of bearings, each, 4½ inches; diameter of spindle in bearings, 1½ inches; diameter of spindle between flanges, 1 inch; floor space, 2 x 6 feet; weight, complete, with counter-shaft, 600 pounds.

difference, he intimates that there might be by the words: 'Now, conceding that some difference between the local rate and the Missouri Pacific's proportion of the through rate is permissible under the Interstate Commerce law, owing to the different conditions affecting the two shipments, the one being a through shipment and the other a local shipment, the question I submit under the second and third counts is whether the difference shown in this case between the two rates of 12 cents per 100 pounds is, under all the circumstances of the case, a reasonable difference or an undue and unreasonable difference not justified by the circumstances under which through shipments from Chicago and local shipments from Hannibal are made.' Now, whether or not this definitely means that a difference of rates can be made, it would practically result in a jury, when called upon to figure the proper difference, deciding in favor of its own locality. In other words, this leaving of railroad rates in the hands of a jury would result in the through rate being the sum of the locals. From this would re-

cases will, I think, destroy all ground for discrimination. The act states that no greater or less rate shall be made to one person than to another person. In this case Hayward cannot be two persons."

General Freight Agent Paul Morton, of the Burlington, was a witness in the case. Said he: "We don't propose to get excited unless we see the necessity for it, and as yet I see no cause for alarm, because the decision will be reversed. It comes up on appeal before Judge Brewer, and I am confident he will not agree with the lower court. The decision is entirely against the public. If it is carried out it will end in the railroad's carrying a much smaller tonnage at a much smaller rate."

Judge Beckwith, of the Alton road, and Chairman Blanchard, of the Central Traffic Association, both agree that according to the wording of the act the through rate must be the sum of the locals.

The American square-rigged ship State of Maine arrived at this port last week in 92 days from Hong-Kong.

The Wenstrom Magnetic Separator.*

As the margin of profit in the manufacture of iron continues to decrease attention is called more and more to economics in every department. Beginning at the bottom, in the preparation of the ore at the mine, we notice a general tendency is toward the shipment of richer ores, securing to the mine-owner a better price per ton, which the purchaser is glad to pay by reason of the saving in freight of iron and in the cost of reduction, which depends so largely upon the amount of fuel and flux and the productive capacity of the plant. In other words, the difference in value between rich and poor ores is much greater than their relative percentages of iron indicates, because the barren material in a lean ore is not merely worthless—it is a positive source of expense, requiring transportation, handling, fluxing, smelting, and its due share of general expenses; in return for which it yields nothing and decreases the available capacity of a given plant and capital for profitable work.

The enriching of the ore is done in most places by hand picking, and in a few by wet concentration; but the managers of several magnetite mines in Sweden have been practically successful in doing it by machinery. The only magnetic separating-machine which has actually taken the place of hand picking was designed and patented by Mr. Jonas Wenström, of Orebrö, Sweden.

In this machine, which is illustrated herewith, Mr. Wenström has taken advantage of the property of soft iron to become magnetized by induction. The machine consists of a barrel made up of soft iron bars and some non-conducting material (usually wood), which is rotated around a stationary shaft by means of a cog-wheel. Inside of this barrel, on the shaft, is placed eccentrically a cylindrical electro-magnet, provided with a number of flanges, Fig. 1, between which wire is wound in such a manner that the flanges are of negative and positive polarity, but energized by a current passing through the wire coils from a small dynamo. As will be seen in Fig. 1, the flanges are circular and follow the internal contour of the barrel on the front side, while on the opposite side they are cut down to the line B B', in Fig. 2. Hence the bars of the revolving barrel on the front side of the machine are magnetic only while passing from B to B'; and after they pass the point B' in the lower part of the machine they cease to be so, and remain entirely without magnetism in passing through the space from B' to B, at the back of the machine. The bars have alternately two and three projections coming close to the polar flanges, so that each bar becomes virtually a prolongation of the magnetic poles.

The ore and rock are fed on top of the revolving barrel during half a revolution, being only released after it had passed out of the magnetic field at B'; the non-magnetic material rolls off the barrel and falls in front of the dividing-board, while the magnetic material drops off behind it.

Two sizes of this separator have been introduced. The largest size treats from 6 to 7 tons per hour, and the magnetism is strong enough to support pieces of ore up to 7 pounds in weight, and separate them from the rock. The smaller size treats from 2 to 3 tons per hour of finer material, below $\frac{1}{4}$ pound in weight of single pieces.

In Sweden these separators are used at the iron mines for extracting from old and new dumps of waste material the good ore which has been missed in the hand picking, or was too fine to be picked out in that way. They are

also applied to the ore now being mined, which in former times was selected by hand. Three of the Swedish mines use the larger size of the machine and four the smaller.

During a recent journey in Sweden (unfortunately in the winter, when the dumps were frozen and the machines idle) the writer visited five of the mines where these machines are used, and obtained the records of their working results. It is deemed sufficient to give in this paper, as a typical example, the data thus collected at the Dannemora Mine. Practice elsewhere is essentially similar, the cost varying at each mine in proportion to the handling necessarily given the ore before it comes to the separator.

The Dannemora plant consists of a separator, 24 inches on the face and 27 inches in diameter, a small dynamo and

pieces of ore which may have been mechanically knocked off by larger pieces of rock. The men's work consists of shoveling the ore into the elevator and taking the rock and ore in the cars to the dumps. The amount of material handled averages $6\frac{1}{2}$ tons per hour.

The cost of hand picking at Dannemora previous to the introduction of this machine was 32.6 cents per ton. It now costs 9.8 cents per ton,* and 30 per cent. more ore is obtained from the same material. Analyses of these ores are not frequently made, but it is known that the separated ore averages 59 per cent. iron for the coarse and 45 per cent. for the fine. If the fine ore can be fed by itself in a somewhat different way the results as to that part would be much better.

The separator was introduced in 1886, during which year no permanent plan,

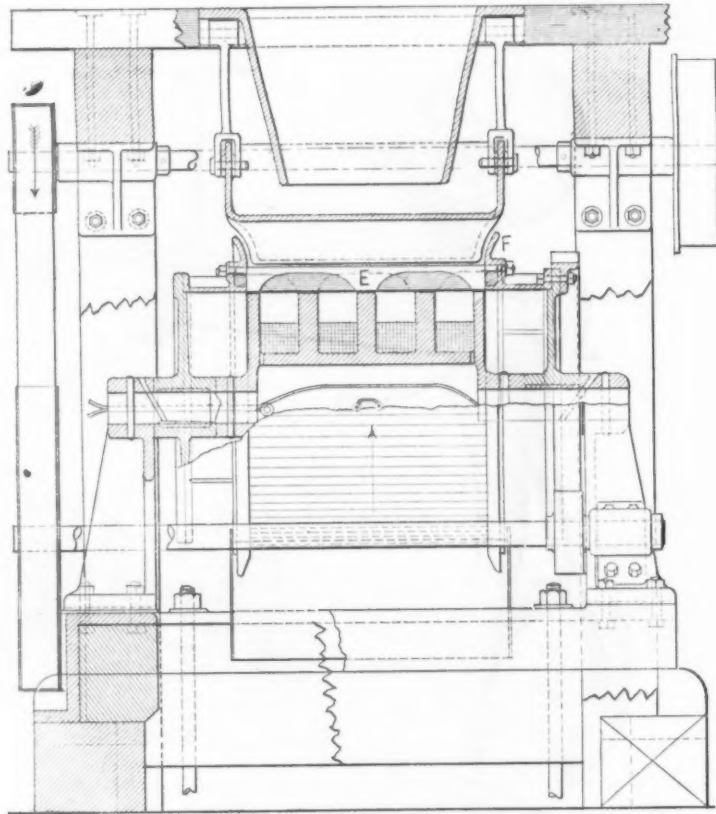


Fig. 1.—Cross Section.

THE WENSTROM MAGNETIC ORE SEPARATOR.

a portable engine, which runs not only the separator but also a bucket-elevator and a hoist capable of raising a car loaded with $\frac{1}{2}$ ton of ore. The material, which is anything below a 4-inch mesh, is dumped from a trestle at the elevator, which conveys the material to the feed of the separator, and the separated rock falls into a chute, and is thence delivered into a car and run off to the waste-dump. The ore runs down into a barrel-screen of perforated steel, the holes being 1 inch in diameter. The pieces which pass through fall into one car, while the coarser portion falls into another. These cars are then hoisted on the elevator and run off to the point of shipment. The fine stuff, below 1-inch mesh, is kept by itself for reasons connected with the subsequent roasting. All the ore is roasted, and there is some difficulty in roasting the fine ore. Consequently not more than 5 or 10 per cent. of the charge in the roasting-kilns is permitted to be fine. The fuel used in the kiln is the tunnel-head gas from the blast-furnace. Four laborers and an engineer are required to run the machine to its fullest capacity, with a boy to pick out from the rock any

was erected, but the machine was moved from one small waste-heap to another. The present plant was erected in 1887, and during that year, as also in 1888, the separator was run intermittently through a season of five months. The work of the three years was as follows:

Year.	Total material treated. Tons.	Ore obtained. Tons.	Percentage of total material obtained as ore.	Rock. Tons.
1886....	2,000	No data	.....	2,111
1887....	5,720	3,609	63	1,244
1888....	5,169	3,923	76	1,244

Any invention adopted from a foreign country, where the plans of working, as well as the ore treated, are different from our own, must necessarily be changed to some extent to do the work required in

* This includes interest on plant and depreciation. The cost for repairs has been nothing, and the machine shows no wear

* A paper read by Robert Anderson Cook, A.M., of New Brunswick, N. J., at the New York meeting, February, 1889, of the American Institute of Mining Engineers.

America. Apart from this consideration, each ore must be treated in a different way. But that this invention is of practical value to us in America is demonstrated by the fact that it is used profitably in Sweden, where labor is not worth more than 50 cents per day.

There are three different cases to which this machine can be successfully applied, with only one change in the feed (namely, when the ore is below a $\frac{1}{4}$ -inch mesh). First, where there are waste-dumps, and the run of mine has to be hand-picked. Second, where only what might be called preliminary crushing is necessary to break the greater part of the ore free from the rock—that is, by passing it through an ordinary crusher to a $\frac{1}{4}$ -inch mesh, which ought not to cost more than 15 cents per ton. Third, where the ore must be pul-

One, which the Swedish Government settled to the satisfaction of its furnace manager, is that of the use of fine ore in the furnace. It had always been supposed to be a detriment to the furnace to charge a large proportion of fine ore. Experiments were made at the expense of the Government, under the charge of Mr. Granstrom, of Norberg, the eminent Swedish engineer, in the preparation of briquettes of a mixture of fine hematites crushed and concentrated to 65 per cent. of iron with slacked lime in a powerful brick machine. These briquettes were very nice-looking, but when put in the furnace they all went to pieces. Mr. Granstrom then resolved to see exactly how much fine ore a furnace would stand. Taking one of the charcoal furnaces in his charge, he began by using a mixture of 10 per

pieces of iron from the dirt in yards where pig-iron has been stored or from any old heaps of waste material; for instance, where the dumpings from cupolas have been piled.

One of the small Wenström machines was brought over from Sweden to this country last year, and tested with very satisfactory results on limited quantities of different ores and waste material from around steel-works. One instance in particular may be mentioned—namely, the treatment of cinder from the Bessemer converter, a material which is almost wholly thrown away at American steel-works, a small portion only being used in the blast-furnaces. A hundred pounds of this material, crushed in an ordinary Blake crusher, was run over the separator, the result being 25 pounds of magnetic material containing 70 per cent. of metallic iron. The same quantity of this waste product from another steel-works gave 38 pounds of magnetic material.

A machine was sent a short time ago to the Lackawanna Iron and Coal Company, at Scranton, Pa. At these works the waste from the cupolas and from around the runners at the converter has been for a long time treated by putting it in a "rumbler" such as is used for cleaning castings at foundries, only of a larger size. The fine pieces of slag and iron are thus broken up and fall through the rumblers, and these have always been sent to the waste-dump, while the coarser pieces are taken from the rumblers and sent to the cupola to be melted over again. At present the fine waste before it goes to the dump is put over the Wenström separator.

The following is the result of 11 days' running (from March 3 to 13, 1889), four and a half hours per day, 198½ tons of waste being put over the machine. From this quantity there was obtained 35 tons 3 cwt. of iron. Two men were added to the force at the rumblers to handle the material to and from the separator. The engineer was the same who ran the rumblers, and the steam for running the separator was obtained from the same boiler, so that the total expense was only \$2.50 per day for coal, labor and oil.

The handling of converter-cinder on a large scale has not been undertaken as yet by the Lackawanna company, the crusher required not being ready.

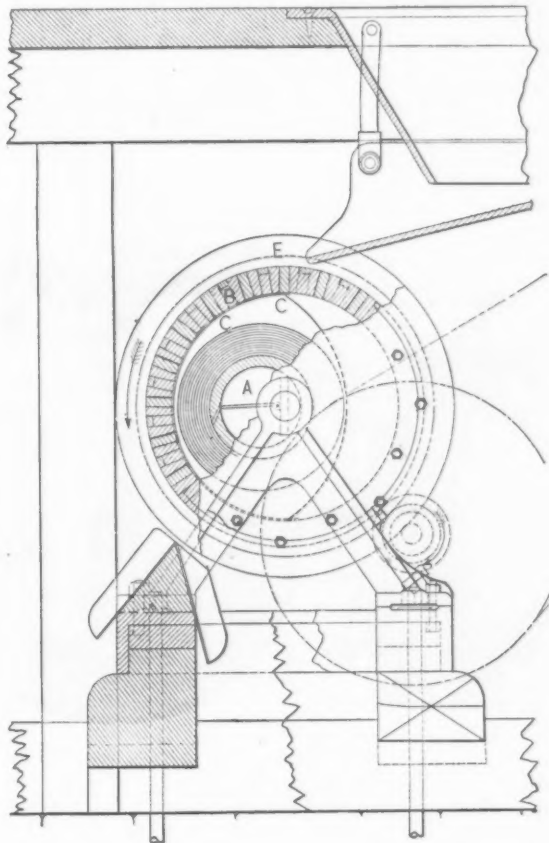


Fig. 2.—Longitudinal Section.

THE WENSTRÖM MAGNETIC ORE SEPARATOR.

verized by further machinery to a $\frac{1}{4}$ -inch mesh or some smaller size.

The first two of these cases are very simple, but the third is a problem by itself, in which the cost of mining, the number of tons which must be crushed to obtain one ton of concentrate and the cost of crushing are items of far more importance financially than the mere separation of the ore from the rock. Each mine-owner must decide for himself whether it will pay. The cost of separating ore per ton of finished product by any machine it is impossible to give, since it varies with the richness of the ore. A Wenström machine requiring 1½ horse-power to run the dynamo and ¼ horse-power or less to run the separator has a capacity of 50 tons of fine (or a larger amount of coarse) material in ten hours. The feeding should be automatic, and the ore and rock should fall by their own weight into the cars, so that there need be no hand-labor except that of feeding the crusher or screen if coarse material is to be used.

Some interesting questions arise in connection with the concentrated fine ore.

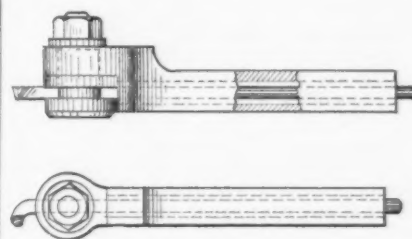
cent. fine ore and gradually worked it up to a maximum of 75 per cent. The only change he found with the latter mixture was that the gases were a little hotter, and he was able to carry a little heavier burden on the furnace. The pressure was the same, and the conclusion reached was that the manufacture of briquettes was entirely unnecessary.

Another question concerns the effect of fine concentration in reducing such impurities of the ore as enter the pig-iron made from it. This has never yet been carried so far in practice as to convert a non-Bessemer ore into a Bessemer ore by eliminating, through the process of concentration, the phosphorus contained in the gangue; but in all the concentrations of ores, wet or dry, the impurities have been materially reduced, and it seems not unreasonable to expect that many ores which are but little outside the "Bessemer limit" will be brought within that limit and thus made more valuable.

There are other uses to which this magnetic separator has been profitably applied in Sweden. One is that of separating the

New Tool-Holder.

A neat form of tool-holder has lately been devised, says *Engineering*, of London, by Mr. Baldwin H. Bent, B.A., Demonstrator of Mechanism and Mechanics in the University of Cambridge. It is



Bent's Tool-Holder.

illustrated in the annexed views. The tail of the cutter lies in a hollow formed in the handle of the holder. By reason of this arrangement a relatively long piece of steel may be used to form the cutter, and when it is so far reduced that the remainder has to be thrown away the piece wasted bears only a very small proportion to the part which has been used. The cutter is secured by being passed through a slot formed in the shank of a bolt just

beneath the head. When the nut of the bolt is tightened it nips the cutter between the bolt-head and a flat surface on the holder, holding it very stiffly and securely.

Aerated Fuel.

Manufacturers are always interested in the question of cheaper fuel, and none are more deeply concerned than the iron-workers, especially those who cannot dispose of their present valuable plant and move into the coal or natural gas regions. The subject here presented is therefore of timely interest. For nearly two years past the Aerated Fuel Company, of Springfield, Mass., have been placing their oil-burning system upon the market, and seem to have accomplished remarkable results, if we are to rely upon what some of the large manufacturers who are using their process claim for it. The accompanying engravings show the form and arrangement of a burner-cylinder and the application of this method of burning oil to a boiler and a forge. The air space, Fig. 1, is filled by a compressor which should

of general work. One cylinder containing six burners is placed on one side only, leaving one end open to receive the work. If desirable both ends may be left open, especially when it is desired to heat long pieces of iron or steel at the center. By putting an adjustable movable brick partition in the center as many burners as are not wanted can be shut out, thereby reducing the area of the fire-box, and only using one or two burners, as may be best suited to the work being done. This style of forge is in use at the repair shops of the Boston and Albany Railroad, at Springfield, and is regarded by the superintendent as being far superior to that using coal for all work requiring a high degree of heat at short notice.

The above company have many forges, muffles, ovens and similar fires, using over 1800 burners, consuming crude Lima oil burned by being atomized by governed air-pressure, and producing heat similar in quality to that of natural gas, but yielding, it is claimed, better effect upon iron, steel, brass and other metals. It can be adapted to nearly any forge now in use, but a compressor is necessary, as a blower

as the Atlanta, but will be much more formidable craft, better armed, of higher speed, and in fact representing six or seven years' advancement in naval construction. They are patterned generally upon the Medea, an English cruiser of great speed and combining many good qualities. They will be larger, however, by 100 tons and embody many improvements suggested by the working experience of the Medea. It would appear that particularly good inducements are held out to bidders for constructing them, for the designs of the Department, which are based largely upon the performance of the Medea, supplied 10,000 horse-power, which is estimated to be sufficient to drive the vessels at 20 knots speed. If this expectation is realized upon trial the contractors will receive the respectable bonus of \$200,000, or \$50,000 for each quarter knot above the 19 knots they must guarantee. The dimensions of the new cruisers will be as follows: Length, 300 feet; breadth, 42 feet; draft, 18 feet; displacement, 3100 tons; full coal capacity, 628 tons. The armament will consist of one 6-inch and ten 4-inch rapid-fire guns (the latest idea in naval arma-

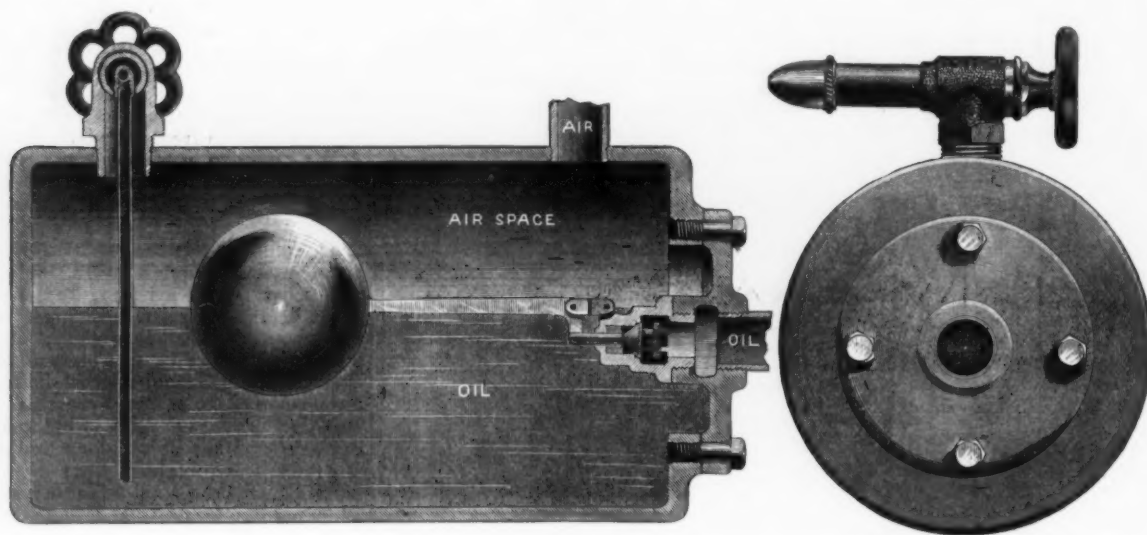


Fig. 1.—Interior and End View of a Burner Cylinder.

maintain an air-pressure of from 10 to 25 pounds per square inch, according to the kind of work being done. Although the nozzle of the burner is small—from $\frac{1}{8}$ to $\frac{1}{4}$ —and only a small quantity of air is used, yet it must be under an equal pressure in order that the oil may be finely atomized before igniting. The object of the float is to prevent the flowing of oil into the cylinder and rising above the mean level as established by the governing device in each cylinder. The float falls of its own weight so as to open the valve and allow the oil to rise again to the mean level. The process does not depend upon the oil flowing to the burner by gravity, and therefore the oil reservoir is placed at any convenient point below the burner, to which the oil is drawn by the current created by the escaping air. For this reason the oil ceases to flow through the burner when the air-pressure is removed and the flooding of the furnace is rendered impossible. One valve controls both the oil and air. The application of this system to the heating of boilers has met with success. The following advantages are claimed for it over coal: Uniform heat, constant pressure of steam, no ashes, clinkers, soot or smoke, and consequently clean fires; one man can attend to from 10 to 15 100 horse-power boilers.

Fig. 3 shows the system applied to a forge adapted to a large variety

will not maintain the pressure required. One important point regarding the safety of this system is the fact that although some 1800 of their burners are now in use, as stated above, in not a single instance have the insurance rates been increased.

Bids for More Cruisers.

The Navy Department has issued advertisements inviting proposals for the construction of two steel cruisers of 3000 tons displacement, under the authority conveyed by the Appropriation act of September last. The contractor is required to guarantee a minimum speed of 19 knots for four consecutive hours, and there is a bonus provided of \$50,000 for every additional quarter knot and a deduction of the same amount for each quarter knot deficiency. The vessels are to be completed in two years, and exclusive of the speed bonus their cost is not to exceed \$1,100,000 each. The contractors are allowed to bid for the construction of the hull and machinery according to their own designs or to accept those furnished by the Department. The proposals are to be opened August 22, and the time for the receipt of proposals for building the three 2000-ton cruisers has also been extended from August 1 to the same date.

The new vessels will be about as large

ment) and eight machine guns. The ships will be two-masted-schooner rigged, but will carry sail enough only to steady them in a sea-way. Altogether, if the vessels realize expectations they will be the fleetest and hardest vessels in the navy.

We have been favored by E. J. Jacobus, Potter Building, New York, agent for Charles Cammell & Co., Limited, with a full account of a disastrous railroad accident which occurred at Penistone, England, some weeks since, and in which the excellent character of the Cammell steel rail was demonstrated in a very striking manner. A broken axle threw the train off the track over which it was running at a high rate of speed. The cars were badly wrecked and a number of people severely injured, one being killed. Describing the scene after the wreck, the Sheffield *Telegraph* says: "On the permanent way the effects of the accident were equally visible. The rails, made at the works close by, were branded 'Cammell's toughened steel,' 25 feet in length and 75 pounds to the yard. Yet the engine bent and twisted them like strands of wire. One massive rail was curved into the shape of the letter 'S,' and another was bent round to form a huge horseshoe. That they were 'toughened' were clear enough, for in no instance had

the force to which they were subjected caused them to snap or even to 'peel.' Messrs. Cammell & Co. should secure these rails as specimens of what they can do in rail-rolling." The axle which was the cause of the accident was made by

per cent. more than some of our competitors paid for the same work. This took place here in Pittsburgh in Amalgamated mills and has been going on for years, and there are several such mills here. I can name many such cases, differing from this

the wages question; they have abolished the advance that formerly existed in Western prices over Pittsburgh and the valleys; they have totally failed in their efforts to raise the Eastern prices to Pittsburgh rates; they have held Pittsburgh prices so high as to make the manufacture of iron here unremunerative. This is proved by the fact that some of our old and well-managed establishments have failed and their mills are now idle, and few of the others are working to advantage. Four years ago the officers of the Amalgamated Association saw what was just and necessary, and proposed and carried a reduction (but it was recalled next year), and for this they were nearly thrown overboard. The rapid and increasing use of steel makes a reduction in the rates of wages more necessary now than ever before. It is no answer to say that manufacturers show, by keeping their mills in operation, that they are able to pay the present prices; that is neither an intelligent nor an equitable way of settling the question. Manufacturers have undergone a great deal of twitting and misrepresentation in consequence of their unwillingness to undergo the heavy losses incident to a strike and stoppage of their business and its transfer to other districts not affected, and an intelligent and fair association should not require it.

I am firmly of the opinion, in which I am joined by many intelligent workmen, that the very best thing the convention of the Amalgamated Association can do for themselves and the business interests of the employers would be to calmly investigate the whole situation and propose a readjustment. By so doing they will show their capacity for appreciating the needs of business, and prevent the enlarging of the list of non-union mills.

Dynamite explosions under the direction of General Hastings, who is clearing away the debris at Johnstown, add new terrors for the inhabitants of that afflicted city. On Saturday chimneys and glass suffered severely, and in the evening General Manager John Fulton, of the Cambria Iron

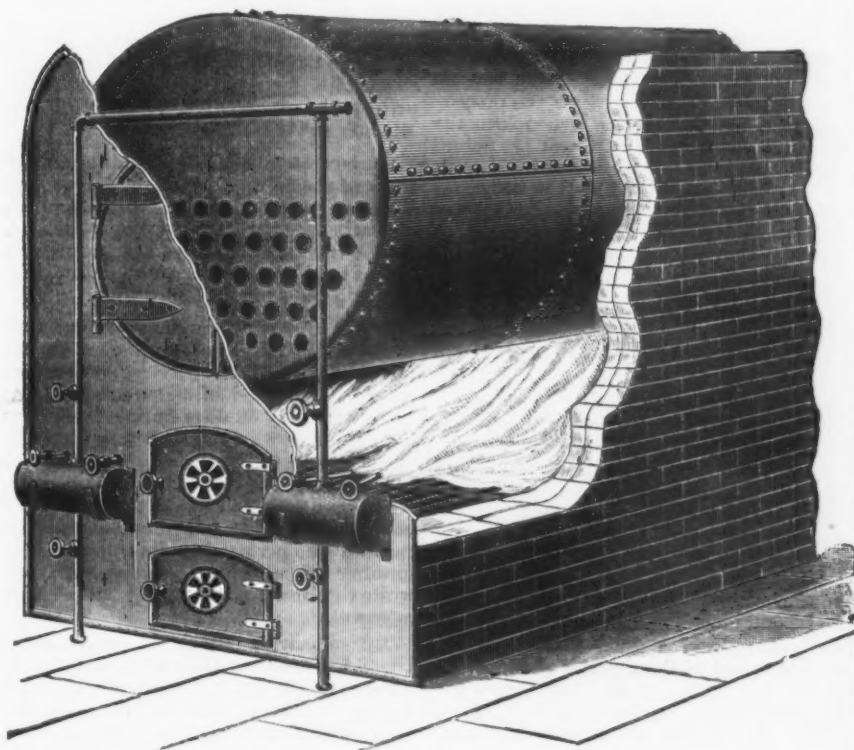


Fig. 2.—Application of the System Under a Boiler.

Vickers, Sons & Co., Limited, of Sheffield, who are regarded as very reliable manufacturers.

Western Prices for Puddling.

David B. Oliver, of the well-known firm of Oliver Bros. & Phillips, large iron manufacturers at Pittsburgh, recently contributed the following letter to the Pittsburgh Dispatch:

Anent the Dispatch editorial of this date headed "Leveling Them Up," referring to the action of the Amalgamated Association in establishing lodges in the Eastern mills and their efforts to bring Eastern prices up to the prices paid here, it is certainly to be hoped they may succeed. They have been engaged in these efforts for the past 12 years and so far have but little to show. Last week's *Labor Tribune* indulged in congratulations on the successful result in a strike in the mill in Danville, Pa., which ended in fixing the price for boiling at \$3.60 per ton; in Pittsburgh the price is \$5.50 per ton; both these are Amalgamated prices. All practical men I think will agree with me in saying that the facilities are better in Pittsburgh for doing this work than they are in Danville.

While the Amalgamated Association are engaged in this laudable work in the East it is to be hoped that they will not allow these outrageous discriminations to take root and grow up right here at home. It is a fact well known to many manufacturers and workmen that for several years past the scale of prices in many important respects in some Pittsburgh mills has been a dead letter, to the advantage of some employers and the disadvantage of others—their competitors who pay the prices called for by the scale. A short time since a large order was distributed among several Pittsburgh mills. Our company received a portion of it, and for the rolling of the part that we made we paid just 300

one only in degree, and I am ready to furnish the details to any one who may call on me and who may have the right to know them.

These discriminations cover a large part of the product of some of our largest mills.

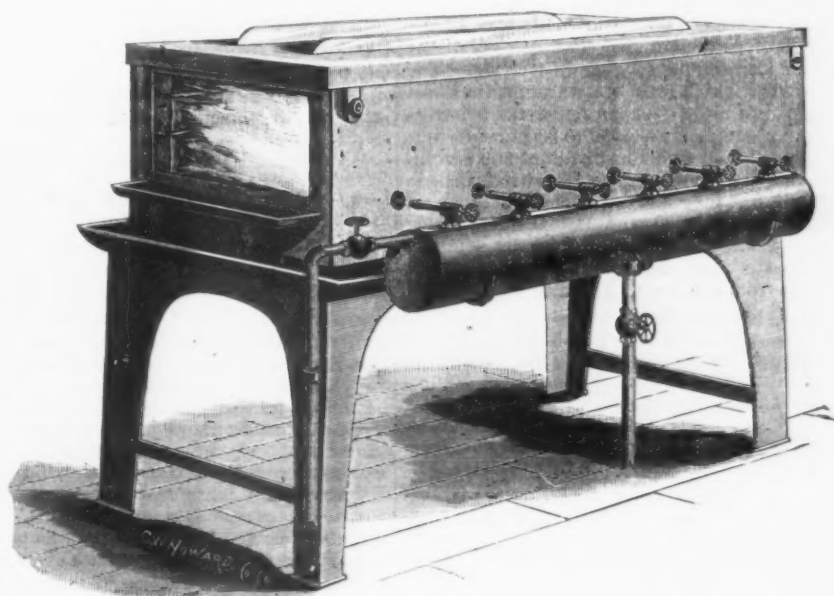


Fig. 3.—The System Applied to a Forge.

To say they are unjust is no description. They are dishonest and they must be remedied. I am not overstating the case when I say that for several years past the Amalgamated Association have been discriminating heavily and directly against the business of Pittsburgh and the Mahoning and Shenango valleys in their treatment of

Company, dictated a forcible protest to Governor Beaver, saying that the mills and offices of the company were being ruined by the blasting; that no attention had been paid to two requests for its discontinuance, and that the State would be held responsible for any further damage done.

THE WEEK.

Mayor Grant declares his hostility to the particular form of rail commonly in use by street-cars in this city, known as the center-bearing rail, and he is determined that there shall be no delay in making a change if improvement can be enforced.

An Ottawa dispatch says: "The refusal of the Washington Government to grant bonding privileges to the Canadian Pacific Railway over their line through the State of Maine to the Atlantic sea-board is causing considerable alarm in official circles here. The Canadian Pacific claim that the refusal of the United States authorities will render useless the entire line for freight-carrying business, and will involve a loss of several millions, besides defeating the object of the line in securing a short line to the Atlantic sea-board. A cabinet minister said: 'The refusal of the American Government to grant privileges precisely the same as are now enjoyed by other Canadian lines in the United States and several American lines in Canada was most extraordinary and would not at all tend to improve the strained relations now existing between the two countries.'"

Within the last 12 months 11 American breweries have been capitalized in London at figures averaging £578,000. The *Statist* remarks quite sensibly: "The Americans are at least as enterprising and as keenly alive to the value of a good business as any Europeans, and they would hardly allow these brewery companies to come to Europe if they thought them worth the price at which they have been sold."

A trial run of the latest improved Sims-Edison electric torpedo was made at Willett's Point last week in presence of Captain Roessler and a number of officers of the regular army stationed at the Point, the improvement being an increase of speed from 10 miles an hour to from 18 to 22 miles, attained by making the lines of the hull of the float much finer and by an increase of the motor power. Heretofore the highest average rate of speed attained was 10.04 miles per hour. In a run of over 800 feet the speed made was at the rate of a fraction over 21 miles per hour, the time elapsed being 25 seconds. The current which was sent through the cable during the 800-foot run registered 900 volts and 25 amperes—equal to 30 horse-power. The 30-inch screw made about 900 revolutions per minute. The improved torpedo is 30 feet long and 20 inches in diameter and weighs 3000 pounds. It has a screw propeller and rudder, the former being at the stern and the latter on the back a few feet from the stern. The hull is supported at a submerged depth by an indestructible float, which, like the hull, is entirely of copper, and is attached to the hull by an upright steel stanchion and steel blades, which run at sharp angles, connecting the hull and float both at bow and stern, which enable it to dive under any obstructions met with when running.

It is learned that the Canadian Pacific Railway propose to establish large car works in the State of Maine at a point on their line through that State. The company hope by this means to evade the possibility of any interruption to passenger traffic by using American-built railway cars.

To prepare for the fall trade the Reading Railroad Company have given orders for 750 coal cars, of which 500 are in course of delivery.

The great "Sugar Trust" appears to be working satisfactorily to the members of that organization, despite a decision of the courts declaring its illegality. The profits are enormous and increasing. The consumption of sugar in the United States

last year was estimated at nearly 1,500,000 tons, of which 1,000,000 tons passed through the refineries controlled by the trust. The net profit to the same at 4 cent per pound—or say \$14 per ton—yielded \$14,000,000; refiners outside at the same time realizing altogether \$5,000,000 profit. The sugar brokers Willett & Hamlin, of this city, who make these calculations, say in their circular just issued that up to April 1, 1889, there was no special profit to refiners over the preceding year, but for the last two months the meltings yielded at least 1 cent per pound additional profit—"say a total net profit for the five months of \$8,230,000" for the so-called Sugar Refineries Company and \$3,410,000 for outsiders. Next to the Standard Oil concern the Sugar Trust is a success.

W. J. Coombs, of New York, head of the long-established exporting firm of Coombs, Crosby & Eddy, in addressing the National Furniture Manufacturers' Association, at their meeting in this city last week, spoke of the increasing popularity of American products in foreign markets. He said the principal reason the country had no maritime marine was that vessels could not obtain return cargoes. American manufacturers were competing in the foreign markets and driving all others out. Twenty years ago there was hardly anything going out but axes and wooden ware, and now almost everything made in the country had a good market abroad. That was due to the superior skill, intelligence and energy of the American workman. America was now doing a large trade with the English colonies and sending carriages to Africa. American goods were paid for in cash in countries where the English merchants had to give credit.

Pensacola has been chosen as the shipping point for coal from the Alabama mines to supply Cuba and the West Indian trade, which is expected to reach 400,000 tons annually. Steel barges will be employed.

The Carson Mint, in Nevada, has been reopened.

American machinery is in some respects unsurpassed. Yet we see it stated that the United Kingdom exports over \$55,000,000 worth in a single year, as compared with less than \$10,000,000 sent to other countries from the United States.

A number of prizes for technical work were awarded at the fifth annual exhibition of the Hebrew Technical School, held in this city a few days ago.

The agreement negotiated by the Commissioners to the German Conference for the settlement of affairs in Samoa was signed at Berlin by all the members of the conference on the 14th inst. As described in a Berlin dispatch the draft guarantees an autonomous administration of the islands under the joint control of Germany and America, England acting as arbitrator in the event of differences arising. The Samoans are to elect their own King and Viceroy and to be represented in a Senate composed of the principal chiefs and chambers elected by the people. Samoa is to have the right of levying duties of every kind. The agreement also stipulates that the Germans shall receive a money indemnity for their losses. A special court will be appointed to deal with the land question. The *status quo* will be maintained in Samoa until the treaty is ratified in the United States Senate.

The signing by Governor Hill of the so-called "bucket-shop bill" will have a tendency to suppress stock-gambling outside of the regular exchanges.

The Montgomery Bridge, crossing the Susquehanna River above Sunbury, Pa., was completed in a little less than four

days by 400 men under the personal direction of Vice-President Frank Thomson. It gave the Pennsylvania Railroad a route to the West without using the main line west of Harrisburg. The bridge is nearly 1000 feet in length, and the swiftness of the current made the work of construction extremely difficult.

The Nicaragua Canal Company are reported to have bought the Pallas Line of steamships for \$400,000, the new enterprise to be represented by Mr. Hall, ex-Minister to Central America.

An increase of \$34,500,000 in the capital stock of the New York, New Haven and Hartford Railroad Company will be applied, in part, to four-tracking the main line, double-tracking the Shore Line from New Haven to New London, and for exchanging with the stock of leased lines.

About 15,000,000 gallons or one-sixth of the entire daily consumption of Croton water in New York City go directly to supply the demand of manufacturers. As there were only 53 days during 1888 when the natural flow of the river was not sufficient to supply the aqueduct to its full capacity, there is liable to be no scarcity. Next year the new aqueduct will probably be ready for use, and the Sodam Dam capable of performing its functions in forming an additional storage reservoir, while the Bronx River supply will also be augmented.

A "submarine bridge" is proposed between Elsinore and Helsingborg, to be incased in a double tube, having the outer skin iron and the inner one steel, the space between the shells being filled with concrete. It is proposed submerging this bridge sufficiently to allow ships to pass over it.

Experiments in welding wire rope by the electrical process show that the strength of the finished welding is within 18 per cent. of the normal strength of the cable.

Canada will soon have an independent Atlantic cable to England, the \$2,000,000 required having been nearly all subscribed, and Honolulu merchants expect soon to have a cable to San Francisco.

The New England Water Works Association held its eighth annual convention in Fall River last week, President Hiram Nevons, of Cambridge, delivering the address. Superintendent George A. Stacy, of Marlboro, read a paper on hydrants, in which he explained the conditions which existed in his town, with the method of setting and caring for hydrants. A discussion followed, which was participated in by Superintendents W. R. Richards, of New London; Dexter Brackett, of Boston; Edward Darling, of Pawtucket; J. M. Clark, of Northampton; Charles Eglee, of New York; George E. Winslow, of Waltham; H. W. Rogers, of Salem; Chief Engineer Keating, of Halifax, and others. At the evening session Prof. J. G. Denton, of the Stevens Institute of Technology, Hoboken, N. J., addressed the association on "The Economy Attained by Modern High-Expansion Type of Pumping-Engines."

There have been fewer strikes thus far this year than there were during the same period of the previous two years. We quote from *Bradstreet's* the following statistics: "Since January 1 there have been reported 296 strikes, involving 75,110 strikers, against 389 strikes and 111,201 strikers in 1888 and 511 strikes and 212,317 strikers in five months of 1887."

The damage done at Holyoke, Mass., last week by the bursting of the canal bank is now placed as high as \$200,000, without counting the loss in wages, to the mill owners and the water-power company. Some idea of the extent of damage may be understood when it is known that there are in the city 24 paper mills with a daily

product of 200 tons, and owning 121 mill-powers, in addition to which there are 14 other manufactories, owning 71 mill-powers, all of which are either wholly or for the most part shut down on account of the break, thus throwing out of employment from 10,000 to 12,000 people, at a daily loss of at least \$15,000.

A 300,000-gallon iron tank in the oil yard of the National Storage Company, in Jersey City, was struck by lightning on Saturday afternoon and exploded with a force that blew the iron top 70 feet in the air and shook houses a mile distant.

A committee of investigation find that an explosion of malt dust originated a fire that recently occurred in Opperman's brewery, in this city. As a preventive malt mills are equipped with magnetic devices for arresting iron and steel substances before they reach the steel rollers, causing sparks. There is, however, no device which will arrest small flinty stones, and it is believed that in this case a small stone, coming in contact with the roller, caused a spark which ignited the dust, thus making an explosion.

It pays to plant willows. The examination which the Government engineer in charge of the Potomac River improvement made shows that the water reached a height of 2 feet 7 inches above the high-water mark of the freshet of 1877, which was the highest of any known or recorded freshet. The wisdom of planting willows upon the new lands has been justified. That portion of the newly-made flats upon which willows were planted was protected from washing, so that practically no damage was done there, while in the portions of the improvement which were not so protected there has been great loss.

The removal of broken stone at Flood Rock, in Hell Gate, the debris of former explosions, will be renewed at once, but will not be finished under two years. Colonel Gillespie, who has direction of the work, will seek authority for removing other obstructions from the river which are equally dangerous, notably Diamond Reef, between the Battery and Brooklyn, a reef off Thirty-third street, East River, also the obstruction known as the Middle Ground, and which lies just beyond Ward's Island, in mid-channel, over which there is a draft of but 12 feet at low water.

Governor Beaver, of Pennsylvania, announced that he had abandoned the plan of taking money from the State Treasury for the relief of Johnstown, and that he had accepted the offer made by officers of Philadelphia banks to advance him \$1,000,000, without interest, and without security other than the Governor's promise to endeavor to have the Legislature make an appropriation to repay the loan.

The amount of water passing over Niagara Falls varies with the height of the river. Prof. W. D. Gunning estimates the average amount at 18,000,000 cubic feet per minute. Allowing 62½ pounds to the cubic foot, this would give a total of 562,500 tons per minute, or 25,312,500 tons in 45 minutes, of which somewhat more than two-thirds passes over the Horseshoe Falls. Other estimates place the total amount passing over both falls as high as 100,000,000 tons per hour. In comparison, the flood at Johnstown was a gill.

The Minnesota Iron Company, at their meeting at Duluth, after reporting a surplus for this year's business amounting to \$1,300,000, decided to put it into a line of ships for the ore trade, to be built at once. The sum of money to be expended would build about 30 300-ton vessels; but there will be several large and costly steamships of the most approved lake

models, none of them to be less than 3000 tons capacity and fast travelers. They will probably be fitted with triple compound engines of not less than 1200 horse-power. The Minnesota Iron Company are shipping this season, together with their associate mine, Chandler, nearly 30,000 tons a week. The vessels to be built will be capable of carrying considerably over 100,000 tons a month, thus enabling the company to handle nearly all their present output of ore.

The Chesapeake and Ohio Canal stockholders have resolved to repair the damage by the flood as soon as possible. About \$300,000 will be the cost of the work.

The Institution of Civil Engineers gave a reception on the 14th inst. at London in honor of the visiting American engineers. President Goode warmly welcomed the guests, and said that their influence had been one of the principal factors in raising the United States to the place of one of the foremost nations of the earth. Professor Thurston, in behalf of the visitors, returned the heartiest thanks for the cordiality with which they were received.

A floating workshop, to be known as the steel torpedo-depot ship Vulcan, was launched at Portsmouth, England, last week. It is intended that she shall accompany a fleet and carry a large equipment of torpedo-boats. She will be supplied with hydraulic cranes on which torpedo-boats can be twisted in and out of the water. The Vulcan is of 6620 tons burden and 12,000 horse-power.

Senator Cullom says he has already made up his mind with reference to railway management that ultimately Canada and the United States will have to inaugurate an arrangement corresponding to the present Interstate law. "So far in the investigation," he said, "the Canadian officials all affirm that the present law hurts them, and those in this country are positive that Canada profits most by the measure. The argument of our managers was that where the Canadian roads lost on the long hauls extending into this country they recouped on local rates in Canada, while with roads wholly under the operation of the Interstate law this was impossible."

Engineer Burke, of the British man-of-war Calliope, the only vessel that escaped from Apia harbor during the great storm there, has been promoted to be fleet engineer as a reward for his services in enabling the vessel to steam out of the harbor.

The Union Trust Company will erect an 11-story brick and granite front office building at Nos. 78 to 82 Broadway and Nos. 3 to 7 New street. It will have a frontage of 72 feet, will run back 106 feet and will cost \$600,000.

Experiments recently made in electric-subway ventilation in this city have been eminently satisfactory. A large blower has been placed in the basement of the Hotel Metropole, at Forty-second street and Broadway, and connections made with the subways. A constant current of air is sent down along the line, and at Fourteenth street a pipe runs out of the man-hole to the roof of one of the houses. Mr. Kearney, the engineer, says that the system will be applied in other places and that all danger of man-hole explosions is now over.

Farming lands in New York State are depreciating. The assessors in 14 counties visited found that farming lands had depreciated in value while city property had increased in value. State Assessor Wood is of the opinion that in a few years there will be nothing much but tenant farmers in this State. The same facts are observed in Pennsylvania.

MANUFACTURING.

Iron and Steel.

The Riverside Iron Works, of Wheeling, W. Va., booked an order last week from the Standard Oil Company for 27 miles of steel pipe. The concern are enjoying an excellent demand for this article at present.

The following is the report of Fayette Brown, receiver of Brown, Bonnell & Co., of Youngstown, for April, 1889: Balance on hand, April 1, \$6,729.93; receipts in April, \$228,720.31; total, \$235,450.24; disbursements in April, \$229,722.93; balance on hand April 30, \$5,727.31.

McClure & Schuler, engineers and contractors, of Pittsburgh, who have the contract for the erection of three hot-blast stoves of the Massick & Crookes design, for the blast-furnace of the Bellaire Nail Works, at Bellaire, Ohio, are pushing the work forward to completion as rapidly as possible. When completed the stoves will add considerably to the productive capacity of the furnace.

A press dispatch from Newcastle, Pa., under date of the 13th inst., says: Samuel S. Brown, William Henry Brown, Lizzie B. Ward and James Ward have begun proceedings in the court of Lawrence County against James M. Schoonmaker and Hugh Burgwin, executors of Alice B. Schoonmaker, deceased, for partition of the real estate situated in this county of the late William H. Brown. The property is known as the Shenango Iron Works property, on which is located Oliver Bros.' Rosena Furnace, and other real estate in this city, and 45 acres of coal lands in Shenango Township. The property is valued at \$100,000 and the greater portion of it has been lying idle for years. It was lately owned by the old firm of Reis, Brown & Berger. The Alice B. Schoonmaker mentioned above was a daughter of William H. Brown, and the property is tied up in such a shape that nothing can be done with it.

Singer, Nimick & Co., Limited, steel manufacturers at Pittsburgh, are putting in a Boulton apparatus for making steel ingots, manufactured by the Solid Ingot Company of Newark, N. J.

The Keystone Bridge Company, of Pittsburgh, report bridge-building as unusually brisk this year. They have orders for 10,000 tons of work in hand, which will keep the plant busy until next fall. Altogether the works will turn out 17,000 tons of structural iron this year, which is 2000 tons more than ever before in the same time.

On Monday, the 10th inst., the mud-drum in a boiler in the sheet-iron department of the Mahoning Valley Iron Company's Works, at Youngstown, Ohio, gave way, causing the boiler to explode and wrecking four other boilers in the battery. One man was killed and several others were severely injured.

At a recent meeting of the stockholders of the Glasgow Iron Company, of Pottstown, Pa., it was voted to increase the capital stock of the concern from \$300,000 to \$500,000. Of a total of 3000 shares 2765 were voted unanimously for the increase.

The sale of the property of the Newport Iron and Steel Company, at Newport, Ky., which took place a few weeks ago, has been confirmed by the Chancery Court. The plant is now owned by the sureties on Mr. Shriver's bond. It is not probable that the works will be started again very soon.

Under date of the 15th inst., Alex. Laughlin & Co., engineers and contractors, of Cleveland, Ohio, issued the following

announcement to the trade: "We beg to advise you that on June 13 we sold our patents, drawings and such good-will as we may enjoy to Alex. Laughlin Company, Incorporated, who assumed entire charge of our business on that date, and will conduct it in the future, the primary object of this change being to better equip ourselves to handle our constantly increasing business, and at the same time the new company will take up some features in a field for fuel economy, to which heretofore but little attention has been paid by gas engineers. We take pleasure in assuring you that the above-mentioned change will in no way alter our business methods, as the officers of the new company will be selected from our late firm, and the new owners of our patents propose pursuing the same policy as have we. That is, they will guarantee to demonstrate a fixed economy from all plants erected by them before they ask final payment for the same."

The Attalla (charcoal) Furnace, at Attalla, Ala., went into blast on the 15th inst. under very favorable circumstances, as stated by the following private letter from a representative of the company to a friend in Chicago: "You need not hesitate to guarantee our iron as good as any made in the South. . . . More than a dozen different parties who have seen the brown ore in our stock-house say we are very particular, and our furnace man claims that it is a very superior article. We are taking every possible pains with the stock, and I am quite sure I have never seen cleaner and better-looking ore. . . . When we ship a car you need not have any fears about it not being first-class. The heavy rains delayed us and we now expect to light the furnace on Saturday, but it will take some days to get down to work. . . . We want to sell some iron, but must have the top of the market. Not willing to cut prices." This is a new furnace with a capacity of about 60 tons per day. From another source we learn that it started off well for a new furnace, being up to 45 tons, making car-wheel iron. It has been conjectured that the blowing-in of this plant would materially affect the price of Southern car-wheel iron in the Chicago market, but if the Attalla Furnace Company adhere to the policy above quoted buyers may be disappointed in their expectations of a break. Messrs. Rogers, Brown & Co., Cincinnati and Chicago, are the sales agents for the West and Northwest.

The large new plant of the Kellogg Seamless Tube and Mfg. Company, in Findlay, Ohio, has gone into operation with a large force making seamless tubes, and the test of the machinery is claimed to be a grand success. So well are the company satisfied that an increase in their capacity has already been ordered. Hon. Howes Norris, of Boston, Hon. Benjamin Butterworth and Powell Crosby, of Cincinnati, are leading stockholders in the concern.

The first blast-furnace put in operation since the flood by the Cambria Iron Company, of Johnstown, Pa., was fired up on the 12th inst. The furnace was No. 5, and one of those least damaged by the flood. Superintendent Price has made the following statement relating to the starting up of the balance of the plant: "We will be working full in the steel works, blooming-mill, No. 2 rail-mill, the 9-inch mill and merchant-mill by July 1, sure. Some departments will be in operation before that time, but we will not begin to roll iron and steel until then. One of the six furnaces has already been put in blast, and the others will be put in as soon as we can get them repaired. A number of the shapes formerly made at the Gautier works will be made in this

mill until they start up. In less than one month or six weeks at the most the entire plant will be in operation."

A press dispatch from Johnstown, Pa., under date of the 10th inst., says: "The Johnstown Switch Company, whose works were entirely swept away from Woodvale, on the Conemaugh River, are making preparations to rebuild their switch works plant on an extended scale at Moxham, three miles up the Stony Creek, and entirely away from any possibility of any recurrence of the disaster which has overtaken their works here. They employ from 1000 to 1200 men."

J. & J. B. Milholland, of Pittsburgh, manufacturers of engines, machinery and haulage plants for mines, have recently put into successful operation a plant for a coal mine upon the direct-action principle. This is the first plant of the kind built by this firm, although they have put down 75 geared plants, and its operation has been so successful in this instance that they are convinced it is superior to the geared plant, as it runs more smoothly, diminishes the wear and is simpler in construction. The plant was built for the Redstone Coke Works, at Uniontown, Pa. The cars are hauled up a slope $1\frac{1}{2}$ miles in length, the grade being 20 feet to the hundred. The engines are 18 x 40 inches, connected at right angles to the shaft that carries the winding-drum. This drum is 4 feet 6 inches in diameter and holds $1\frac{1}{2}$ miles of $\frac{3}{4}$ -inch steel rope. It is provided with a double friction operated in the usual manner. The bed-plate to which the cylinders are bolted is 18 inches in height; in fact, all parts of the machinery are heavy and substantial, as is required in this class of work. The steam distribution is by the ordinary link motion, to provide for moving in both directions.

The large sheet-mill of the Brooke Iron Company, Birdsboro, Pa., in which there was a strike for a month past, resumed work on the 10th inst., all differences having been adjusted. The company's nail factory, which depended on the sheet-mill for its iron, was enabled to resume.

The rail mill of the Allegheny Bessemer Steel Co., at Duquesne, Pa., is in full operation with non-union men, and it may now be regarded as a non-union mill. The contest was whether the mill was to be union or non-union, and the company have won. The hitch was not so much in regard to wages; the company wanted to be independent of labor organizations, and they have been successful. In addition to the mill in question the Solar Iron Works, Black Diamond Steel Works and the steel works of Singer, Nimick & Co. are being operated by non-union men, and are therefore denominated non-union mills.

Under date of the 15th inst. M. V. Smith, metallurgical engineer, of Pittsburgh, issued the following announcement to the trade: "The following figures show the amount of coal used to heat a ton of iron or steel for seven consecutive months with seven Smith gas-producers and six solid-hearth regenerative gas furnaces at the Beaver Falls Mills of Carnegie, Phipps & Co., Limited, at Beaver Falls, Pa.:

	To gross ton finished product.
November, 1888.....	346 pounds coal.
December, 1888.....	324 pounds coal.
January, 1889.....	310 pounds coal.
February, 1889.....	352 pounds coal.
March, 1889.....	371 pounds coal.
April, 1889.....	343 pounds coal.
May, 1889.....	286 pounds coal.

Gas-makers' wages average 6 cents per ton finished product. The first three of these furnaces were built under the supervision of an engineer, and were of the following dimensions: One furnace working-hearth 7 x 14 feet in the clear; two fur-

naces each having working-hearth 7 x 21 feet in the clear. The last three of these furnaces were built under contract as follows: One furnace with working-hearth 7 x 18 feet in the clear, \$3350; two furnaces with working-hearth 7 x 14 feet in the clear, \$5570, making a total for the three furnaces of \$8920, including gas-producers and connections complete ready for work. Later developments with my system in connection with boilers indicate that a proportional economy may be obtained in generating steam, and I am prepared to contract under a guarantee that the amount of coal per ton of iron for steam and heating shall not exceed $\frac{1}{4}$ ton to the ton of 2240 pounds finished product."

Machinery.

The American Nail Machine Company, of Findlay, Ohio, are engaged in the erection of a high-speed engine of an entirely new design. Patterns are complete and engines built of several sizes, with still more now under way, the full set being 2 to 150 horse-power, the special features being minimum of space, immense speed and direct power, durability and economy of fuel.

The blowing-engine now under construction for the Shenandoah Furnace Company, of Milnes, Va., by William Tod & Co., of Youngstown, Ohio, has positive valve-gear and round steel and brass air-valves faced with leather and closed with springs. The arrangement of the air-valves is such that the total clearance in the blowing-tube is less than 2 per cent. of the cylinder displacement. The above firm have just shipped one of their Porter-Hamilton engines to Carnegie Bros. & Co., Limited, at Pittsburgh, and are building another for the Lake Erie Iron Company, of Cleveland, Ohio.

The Wilson-Snyder Mfg. Company, of Pittsburgh, recently built two pumping-engines for the water-works at Allegheny City, Pa., that have a combined capacity of 35,000,000 gallons of water per day.

The Bucyrus Foundry and Machine Company, of Bucyrus, Ohio, have been established the past eight years, and have steadily increased their business, so that at the present time they are employing 150 hands. Their specialties are steam-dredges and steam-shovels. The products of this company are shipped all over the Union. They also have a good foreign trade. This year's trade shows a slight increase over last year's, and the company report the prospects for this season very good. The officers are: Col. W. H. Harris, president; Howard B. Hills, vice-president and treasurer; W. B. Crittenden, manager; A. B. Stetson, superintendent; A. W. Robinson, assistant superintendent.

The Leechburg Foundry and Machine Company, of Pittsburgh, report that they have plenty of business on hand. Among large orders recently received was one from the Rolled Steel Carriage Wheel Company, of Pittsburgh, for one 6-inch roll train, one 16-inch roll train and other special machinery; also a large roll order was received from the Cohoes Rolling Mill Company, of Cohoes, N. Y.

The American Nail Machine and Mfg. Company, formerly of Ashtabula, Ohio, have lately moved into their new and commodious plant at Findlay, Ohio. The buildings of this company are all built of stone; dimensions of the main building, 290 x 50; foundry, 50 x 80. This company manufacture the well-known American nail-machine and the American high-speed engine. This engine is especially adapted for electric-power plants, where high speed and power are a necessity. This company have splendid shipping facilities, being connected with switches to three different railroads. The officers of

the company are as follows: P. F. Good, president; John A. Scott, vice-president; A. W. Call, secretary.

Main Belting Company, of Philadelphia, finding that their business had outgrown their facilities, purchased a property on Carpenter street, and have just completed a new four-story building 190 x 50, which besides being in a central location has all the necessary improvements for meeting the steadily-increasing demand for their belting. Their trade extends to every State in the Union, from which it may be inferred that they turn out an article having great merit.

The Thomson-Houston Electric Company report the following sales: Narragansett Pier, R. I., 30 arc, 1000 incandescent; Seattle, Wash. Ter., 50 arc; Brockport, N. Y., 20 arc; Troy, Ohio, 50 arc; Somerville, Mass., 100 arc; Binghamton, N. Y., 150 arc; Philadelphia, Pa., 100 arc; Lowell, Mass., 50 arc; Boston, Mass., 1000 alternating; Springfield, Mass., 90 arc; Minneapolis, Minn., 150 arc, 1200 incandescent; Rochester, N. H., 50 arc; Chelsea, Mass., 100 arc; Norwich, Conn., 400 incandescent; Goldsboro, N. J., 45 arc, 600 incandescent; Sorrento, Maine, 30 arc. Also the following isolated plants: Wamsutta Mills, New Bedford, Mass., 400 incandescent; Bennett Mfg. Company, New Bedford, Mass., 600 incandescent; Whittle & Hanrahan, Providence, R. I., 15 arc; H. Ricker & Sons, Poland Springs, Maine, 12 arc; Jewell Milling Company, Brooklyn, N. Y., 300 incandescent; M. W. Hyer, New York, 50 incandescent; Lawrence Line Company, Lawrence, Mass., 50 incandescent; Riverside Mills, Providence, R. I., 25 incandescent.

Ludlow-Saylor Wire Company, St. Louis, Mo., are running full in all their departments. They have just secured the contract for all the ornamental brass and nickel-plated work to be used in the new restaurant now in course of erection corner Broadway and Elm street, St. Louis.

Hall & Barr, of Cedartown, Ga., would like to correspond with manufacturers of cotton-elevating machinery.

W. Kyle, of Mitchell, Ont., wishes information regarding manufacturers of binder-twine machinery.

The Champion Blower & Forge Company, of Lancaster, Pa., have just issued a fully-illustrated catalogue showing the many styles of blowers manufactured by them. The catalogue also describes their exhaust fans, portable forges, pulleys and hangers, tire benders and shrinkers, drill presses, tuyere irons, &c. The apparatus described covers all the machinery used in the forge shop, and includes the improvements and new devices introduced by the above company.

Lodge, Davis & Co., the well-known manufacturers of machinery, have purchased the entire plant of the Cincinnati Corrugating Iron Company, which they will equip with improved machinery for the manufacture of their engine lathes, iron-planers, shapers, upright drills, &c. This will give them a plant about double the size of their present one, which has for some time back been unable to keep abreast of the demand.

Miscellaneous.

The Canton Steel Roofing Company, Canton, Ohio, say their orders for the first week of June amounted to nearly 3000 squares. They are putting on a 700-square roof for the Bellaire Goblet Works, Findlay, Ohio, and one of 500 squares for Deere & Co., of Moline, Ill., the large plow manufacturers.

The Giant Compound Mfg. Company, of Keyport, N. J., are manufacturing what they term Ground Crystals for hardening and toughening cast-steel tools, as well as

dies, taps, reamers, &c. They claim that Bessemer steel can be readily hardened with these crystals. They also manufacture the Giant Welding and Hardening Compound for welding cast-steel at separate heats, for hardening cold-chisels and other tools and for restoring burnt steel. They issue a circular giving a large number of testimonials from well-known iron and steel workers relative to the merits of these compounds, the manufacture of which is covered by letters patent.

The plant of the Lafayette Car Works, at Lima, Ohio, was closed down on the 11th inst. on account of a lack of orders. Three hundred men were thrown out of employment.

Evans & Howard, of 916 Market street, St. Louis, Mo., manufacturers of fire-brick gas retorts, St. Louis standard sewer-pipe and fire-clay goods in general, have just issued a catalogue in which they invite particular attention to the illustrations of 9-inch brick, cupola blocks, tiles and shapes, particularly blocks for retort settings, a large portion of which work is on special orders, and as various in kind as irregular and difficult.

PERSONAL.

Thomas Bray, superintendent of the tube department of the Riverside Iron Works, at Wheeling, W. Va., has resigned his position to accept a similar one with the Warren Tube Company, at Warren, Ohio. Mr. Boyd, formerly his assistant, has been promoted to the superintendency.

Irving M. Scott, manager of the Union Iron Works, in San Francisco, was given a hearty reception by his employees on his return from Washington. The men thanked him for his efforts in securing contracts for the new cruisers. Mr. Scott in reply dwelt on California's great resources for manufacturing, and declared that only brains and enterprise were needed to develop them.

The President has made the following consular appointments: Wakefield G. Frye, of Maine, at Halifax; Joseph A. Leonard, of Minnesota, at Shanghai; Zachary T. Sweeney, of Indiana, at Constantinople; Oliver H. Dockery, of North Carolina, at Rio Janeiro; Oliver H. Simons, of Colorado, at St. Petersburg; George W. Roosevelt, of Pennsylvania, at Brussels; Levi W. Brown, of Ohio, at Glasgow.

W. P. Thompson, of the Standard Oil Company, was elected president of the National Lead Trust Company, Henry Hertz, the first president, resigning.

Through the courtesy of P. M. Schwab, superintendent of the Homestead Steel Works, of Carnegie, Phipps & Co., Limited, at Homestead, Pa., a number of the visiting delegates to the convention of the Amalgamated Association of Iron and Steel Workers, in session at Pittsburgh last week, made a tour of the plant on the evening of the 12th inst. They expressed themselves as being delighted and surprised at the machinery and modern appliances in vogue at the works, and the skill required to operate them.

There is to be a convention in Hartford, Conn., on the 25th inst., continuing four days, of Chiefs and Commissioners of Labor Statistics. President Carroll D. Wright is hopeful that this gathering will be productive of great benefits. A liberal interchange of views is asked of each member.

W. Seward Webb, President of the Wagner Palace Car Company, started from New York to Vancouver by way of the Northern Pacific Railroad, and in about six weeks traveled 20,000 miles in a

special train. Only in the United States, with its wide domain and far extended lines of track, is such an exploit possible.

Andrew Carnegie is in London and gave a dinner to Mr. Gladstone and Mrs. Gladstone at the Hotel Metropole on the 18th, at which a number of distinguished guests were present, including Minister Lincoln, our representative at the English Court.

The announcement of the marriage of John A. Roebling, son of Washington A. Roebling and grandson of John A. Roebling, the great Brooklyn Bridge engineers, the *New York Press* says, recalls to the public mind the life and service of one of America's most gifted sons. Probably to William C. Kingsley and Henry A. Murphy the credit of the great enterprise known as the Brooklyn Bridge, connecting New York and the City of Churches, was in chief due. It would be absurd in these days to say that without Mr. Roebling the Brooklyn Bridge would never have been built, but it is simple justice to record the fact that he built it, and that without his unsurpassable ingenuity the plans of the bridge would have been delayed for many years. He was fortunate in having as his chief assistant and successor his gifted son, Washington, into whose hands came the literal work of building and of carrying out the plans prepared by the elder Roebling and himself.

The new General Appraiser of Merchandise at New York is Donald McLean, a well-known lawyer of this city, recommended by the two New York Senators and others. He is a graduate of Columbia College, and was elected an Alderman from the "brown-stone" district. He is a brother of Col. H. C. McLean, Assistant Architect of the Treasury.

Charles A. Ashburner, the well-known Pittsburgh geologist, had the honorary degree of Doctor of Science conferred upon him at the recent commencement of the University of Pennsylvania, held in Philadelphia, as an acknowledgement of the scientific value and merit of his surveys and reports for the Geological Survey of Pennsylvania. This is a high honor in recognition of individual distinction. Doctor Ashburner graduated from the University of Pennsylvania about 15 years ago with the highest rank in his class, and immediately entered the corps of the United States Light-House Service Survey. Upon the organization of the Pennsylvania Geological Survey he resigned from the Government work and was appointed assistant of Professor Lesley, State Geologist, with whom he has been associated ever since. About two years ago he gave up much of his active State work and went to Pittsburgh to assume connection with Mr. Westinghouse in his extensive mining interests, particularly in the mining of natural gas, latterly, however, making extensive geological and mining examinations in the Rocky Mountains and Pacific Slope.

William Taylor, a prominent citizen of Brooklyn, died on Monday night at his home, age 78. For 33 years Mr. Taylor was connected with the Columbia Iron Works, of which he was the head. He came to this country when 14 years old, from Manchester, England. Mr. Taylor never held any official position excepting that of Bridge Trustee.

Captain Zalinski, inventor of the dynamite-gun, was among the Americans presented at the Court of St. James at the Queen's last levee.

Desolation reigns at Panama, where merchandise and all sorts of personal effects are sold for what they will fetch.

The Iron Age

New York, Thursday, June 20, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

Iron-Ore Supplies.

The thoughtful reader cannot fail to be impressed by the peculiar difference between two valuable papers on the subject of iron-ore supplies which have made their appearance this year. One treats of the subject from an American stand-point, with reference to the sources from which the blast-furnaces of the United States receive their supply, and was prepared by John Birkinbine, of Philadelphia, for the February meeting of the American Institute of Mining Engineers. The other paper is of English origin and formed the official address of President J. T. Smith at the May meeting of the British Iron Trade Association. It treated of the sources of ore supply for the blast-furnaces of Great Britain. Notwithstanding the huge annual output of pig-iron in the United States, which now falls but little short of that of the mother country, the paper of our American author deals very largely with domestic sources of the supply of iron ore and pays but little attention to foreign sources, as imported ores constitute but a small part of the great quantity required to keep our furnaces running. On the other hand, the British author devotes much space to the consideration of the iron-ore deposits of foreign countries and but little to those of his own, in recognition of the fact that British furnaces depend to a very important degree on foreign iron ore, particularly for steel-making. Mr. Smith says that as this description of ore is not found at home in quantities sufficient for steel-makers' requirements, "the sources of external supply become not only an important but a pressing question." Hence his inquiry into the subject, with the view of demonstrating to his fellow-members of the association that they need have no fears of the early exhaustion of the supply. Our American author writes in a justifiable spirit of exultation over the magnificent mineral riches of his country, without a thought as to the possibilities of the future save in the light of still greater development. His British co-laborer writes as one having some anxiety for the future and desiring to allay apprehension.

Mr. Birkinbine's paper states that the estimated product of iron ore in 1888 throughout the world was, in round numbers, 50,000,000 gross tons, of which the United States produced about one-fourth, its output being practically equal to that of Spain, France, Russia, Austria and Hungary combined. We produced last year nearly twice as much iron ore as Spain with all its exports. Great Britain leads this country in ore production by about 15 per cent., but the average richness of its ores in metallic iron is far below that of ours; in other words, if we mined and consumed ores as lean as those used in British blast-furnaces generally, we

would be obliged to raise very much more ore than we do in proportion to the pig-iron smelted. The richest ore used in Great Britain is taken there from other countries. The dependence of British iron manufacturers upon outside sources of iron-ore supply is shown by the rapid increase in importations. In 1868 about 114,000 tons were imported from Spain and Norway for use in steel-making. With the growing requirements for the Bessemer process the importations increased, although up to 1877 the quantity brought in annually did not exceed 1,000,000 tons. But in 1880 the British importations jumped suddenly over 1,500,000 tons, amounting in that year to 2,634,000 tons. This remarkable increase happened concurrently with the development of the basic process, which would naturally have been expected to check importations by rendering a very large part of the domestic output of ore available for steel-making. But the consumption of ore by the acid process continued to increase, and foreign Bessemer ores were required in large quantities from year to year, until in 1887 no less than 3,762,000 tons were imported. This is slightly in excess of the entire output of our Lake Superior iron ore mines in 1886, the comparison showing the magnitude of the British demand on foreign sources of ore supply.

Mr. Smith shows in his paper that the iron-ore resources of Spain and Sweden are equal to any demand which may be made upon them by Great Britain for a very considerable period, but he also reveals another fact of striking significance in the same connection—namely, that the cost of such ores laid down at British works will be enhanced by the early exhaustion of mines lying near the sea-board. Transportation charges have hitherto been very light on Spanish ores destined for Great Britain, but British manufacturers will ere long be somewhat handicapped in this respect. Their competitors in other countries will hardly mourn over the possible effects of the changes which this may bring. Referring to this country, Mr. Smith says: "The United States have so large a territory, transportation over long distances is so cheap, and there is such a constant tendency to move the centers of industrial gravity westward or southward, that the only thing that is certain about the future of the American iron industry is its uncertainty." He might have added, however, that the very great progress thus far made in this country, both in building up an iron industry and in developing vast deposits of good ores, presages a still more brilliant future with its superstructure resting on the solid foundation of an abundant home supply of the essential raw materials.

The *American Architect* for June 15 contains quite an interesting article on the nature and uses of iron and steel, by Louis De Coppet Berg. In the main the statements made are correct, but a few of the inaccuracies are most glaring. It would be inferred from one of the principles laid down for the manufacture of pig-iron that all iron ore is "broken in the stamping-mill and washed in streams, and then roasted or calcined in kilns to remove the moisture and carbonic acid." This bit of news will be highly appreciated by our furnace men. The author further says:

"There is a very strong and tough charcoal iron from South Carolina, but it is used mainly for car-wheels, being too expensive for ordinary work." We presume it must be very expensive, if there is any South Carolina pig-iron in the market, as the last made in that State, to our knowledge, was turned out in the early sixties. The manufacture of iron in any form in South Carolina has long been an extinct industry.

Diverting Trade Channels.

American citizens since the year 1884 have not been permitted the use of canals in Canada on equal terms with inhabitants of the Dominion, and this regardless of treaty stipulations. It is generally believed at Ottawa that the recent order of the United States Treasury refusing to allow the transport in bond of goods passing from one Canadian port to another over the newly-constructed short-line railway through the State of Maine is one of the results of this unfair discrimination against citizens of the United States. In building this road the Canadian Pacific fully expected to divert to that line the trade which, in coming from the Atlantic sea-board, enters Canada through American channels, but if the recent order is persisted in this object will be entirely thwarted. With reference to discrimination against American shippers, a report from the Government at Ottawa, just published, shows unmistakably that, despite the efforts of the Dominion Government to prevent it, shipments of grain through United States channels have increased 260 per cent. during the past nine years, while through Canadian channels they have declined 52 per cent. This appears from the following statement of cereals—wheat, corn, peas, barley and rye (upon which articles the refund is given)—passing through the Canadian canals since 1880, discriminating between those passing from one United States port to another United States port (upon which full toll was collected) and those passing directly through to Montreal, subject to a rebate of 18 cents per ton:

Years.	From U. S. ports to U. S. ports, no refund. Tons.	From Lake Erie thro' to Montreal, refund. Tons.
1880.....	47,029	333,800
1881.....	64,351	146,127
1882.....	63,881	190,604
1883.....	121,876	186,814
1884.....	104,537	142,194
1885.....	117,346	96,599
1886.....	151,551	203,940
1887.....	134,808	185,034
1888.....	169,664	160,368

Other tabulations of statistics relating to the traffic of the Welland Canal and to the freight movement from Lake Erie via Montreal enforced the same truth respecting the futility of efforts to divert United States traffic from its natural channels. These statements, if they cannot be refuted, possess a deep significance to English investors and others who have put their millions of pounds sterling into Canadian public works, and they point, furthermore, to the expediency of arriving at a fair mutual adjustment of outstanding differences between the two Governments, rather than a persistence in measures that embarrass and exasperate without serving any practical end.

The Law of Industrial Conspiracy.

An interesting article in a recent issue of the *Political Science Quarterly* by E. P. Cheyney, on conspiracy and boycott cases, has brought out a very forcible reply from the *Commercial and Financial Chronicle*. The former believes that the courts have done the workingmen scant justice in these matters. The latter defends the action of the courts, arguing that their work, even when they went rather out of their way to find law, has the elements of permanence and growth. The former proposes that State legislatures enact specific laws on this subject, to curb the disposition of the judges to build up a body of decisions affecting it, while the latter is wholly out of sympathy with such a course of procedure, believing that legislators would do well to keep their hands off. Mr. Cheyney alleges that the restraint of trade by labor organizations is a mere trifle compared with that which results from organizations of capital. The disturbance and fluctuation resulting from strikes is not peculiar to those trades where labor is organized, but is even more severe in some others. It is therefore, in his opinion, highly unfair to hold labor organizations responsible for such restraint or disturbance. Nor does he admit that all interference with the employer's independence is necessarily "unlawful." He holds that a business "cannot properly be looked upon as belonging entirely to the employer, but is, in a certain sense, a joint concern." The point with regard to coercion he admits as partly justified by the facts, but he believes that it has been exaggerated by the courts to an extent at once unwarrantable in theory and unwise in practice. He is especially severe on some of the decisions respecting boycotts, holding that the coercion of a boycott cannot be treated as a conspiracy, and that the action of labor combinations in such cases is to be regarded as an accidental rather than an essential element.

In reply to this the *Chronicle* says that the point where courts have been most clearly right and where Mr. Cheyney is most clearly wrong is on the question of interference with employers. Whenever labor disturbances reach an unusual height we have a conflict between two systems of management—one where the employer has the power of dictating the terms and the other where that power is to an equal or greater extent in the hands of employees. In specific cases the employer's power may be and often is abused; but in comparing one system with another there can be no question that it is better to give a man who controls the capital the power to arrange the methods of management, rather than to put it primarily into the hands of those who furnish the labor. The prevalence of the existing system is by no mere accident. It is a result of the survival of the fittest. The fact of its survival is to a great extent its justification. The control of industry by guilds of workmen involves more trouble and abuse and restriction to trade than its control by capitalists. As industry was organized on a larger and larger scale the necessity for capitalist control became more and more obvious. The failure of most of the efforts at co-operation in complicated industries only emphasizes the continuance of this necessity at the present time. The man

who furnishes the capital will generally manage the business more wisely and can be held more fully responsible to other parties in interest than the man who furnishes the labor, with little or no capital behind it.

Mr. Cheyney's general proposition, that what is right for one man to do is right for a large number to do by simultaneous motion, the *Chronicle* says, cannot be maintained. It is right for one man to walk down Broadway, but if 10,000 people agree to walk up and down a certain part of Broadway simultaneously, with the view of obstructing the traffic, the character of the action at once becomes changed. As Jevons says in discussing this matter, many of the arrangements of society are based upon the assumption that individuals will act as individuals. The streets of New York are arranged with a view to accommodate the ordinary demands of traffic, and will accommodate such demands as long as men act independently. If a number of persons insist on doing the same thing at the same time the fact of combination may make a difference at once in the convenience of the public and in the character of the action. So it was with boycotting. The combined refusal to buy of a certain person when he had given no direct ground of dissatisfaction to his patrons except the refusal to obey the demands of an organization more or less remote from him and connected with totally different matters was an obvious perversion of right.

It is clearly true that the decisions of the courts on these questions have been directly in line with public sentiment. The decisions would not have been received so quickly and with such general acquiescence if they had not been in entire harmony with intelligent public opinion. The efforts made in many States to set aside the effects of these decisions would otherwise have been successful, and the boycott would to-day be wielding its demoralizing power in many important industries. The courts have been sustained in the place of last and highest appeal, the minds and conscience of the people, and it is not likely that a new sentiment can now be awakened which will work a reversal of the judgment.

Late Developments in Chili.

Chili has recently been attracting more attention in the United States since American railway builders succeeded in making a contract with the Government to build 600 miles of railway, for the construction of which there was competition from Europe. The only difficulty which arises with public works and private enterprises in that distant republic is the small immigration of laborers from Europe. To enable the American company to build the 600 miles alluded to the Government has, for example, engaged that the number of workmen required shall be forthcoming, and strenuous efforts are being made to push immigration from Europe and elsewhere. Thus some 3000 laborers were picked up and shipped to Valparaiso at the time of the recent collapse of the Panama Canal enterprise. While Brazil has received 120,000 immigrants and the Argentine Republic 300,000 this year, it is difficult to establish a good current from

Europe to Chili, although the latter is in every respect as desirable to settle in as either of the other countries, if not more so. The only difference is that it lies on the west coast and is, therefore, more out of the way. In a year or two there will be a change in this respect, as the Trans-andine Railroad, to connect Buenos Ayres with Valparaiso via Mendoza, will then be in operation all the way through across the Andes. Even now the Argentine Republic is beginning to restrict the number of certain undesirable new-comers from Italy which the general rush thither carries along, and gradually the great inducements which Chili holds out will no doubt procure the latter all the hands needed, thus somewhat dividing the current which almost overwhelms the neighboring State.

Chili stands at present in all the greater need of a copious influx of desirable immigration, as the spirit of enterprise which animates both the Government and the ruling classes has at no time been greater. The finances of the Republic are improving year by year, and its bonds are looked upon as gilt-edged in Europe. Thus the entire indebtedness of a nation of 2,700,000 inhabitants did not exceed \$88,435,071 last year, including \$24,887,916 paper money in circulation gradually being withdrawn; \$40,000,000 of the above amount is payable in gold, abroad, and the balance in silver. The budget shows a surplus since 1886. In 1887 the income was \$45,888,954 and the outlay \$37,113,408; last year the amounts were respectively \$46,775,546 and \$39,615,770. The German Bank and Mendelssohn & Co., Berlin, took a 4½ per cent. Government loan for £1,500,000 last month, the bonds commanding 104 to 106 in the London market. Nothing would be easier than to issue a £4,000,000 loan and redeem the paper money, but after due consideration it was decided more advisable not to disturb the local finances at a blow, the people of Chili finding their interests too much bound up with this paper circulation, at least for the present. The Government uses its surplus for the reduction of taxes and for public works. Thus Valparaiso is to have a dry-dock involving an outlay of \$4,000,000. Next, negotiations are going on with a French company for the building of additional light-houses, in which the electric light will be used, the cost being estimated at \$3,500,000. This amount will in course of time be coming back in the shape of additional ships' dues. The Government income accruing from nitrate refining works is rapidly on the increase, and there is consequently all the greater readiness to reduce taxes. The one on inheritances is to be abolished, also on the furniture in use by residents, and, furthermore, the duties on certain articles of necessity are to be lowered.

The so-called trade balance is all along in favor of that country, as is shown by the following table of imports and exports:

	1888.	1887.	1886.
Imports.....	\$50,000,000	\$48,630,862	\$44,170,147
Exports	70,000,000	69,549,958	51,240,149
Excess of exports.....	\$20,000,000	\$10,919,066	\$7,070,002

This year the exports may not reach last year's value in consequence of the decline in copper. The exports of this commodity during the first five months were as under, in tons fine:

Years...	1884.	1885.	1886.	1887.	1888.	1889.
Tons....	20,604	19,797	18,150	14,567	14,841	12,680

The exports of nitrate were as follows for the first two months (January and February) of each year:

Years.....	1887.	1888.	1889.
Quintals.....	1,591,132	1,908,827	3,605,035

During the entire years 1886, 1887 and 1888 the shipments were as follows:

Years.....	1886.	1887.	1888.
Quintals.....	9,805,238	15,551,567	16,741,019

Nitrate production increases so rapidly because it is so very profitable. During the eight years from 1880 to 1887 inclusive the exports aggregated 66,532,152 quintals, netting \$26,612,861 paper-money profit to the refiners. The quintal equals 101½ pounds American. The bulk of this industry is in English hands. Chili's wheat exportation has ranged between \$4,000,000 and \$6,000,000 annually during late years, the flour selling well on the Pacific Coast. Almost the sole importation from Chili into the United States is nitrate, of which we usually receive about 1,800,000 quintals annually. The exchange of commodities with Chili is shown in the following table:

Calendar year.	Imports from Chili.	Exports to Chili.
1888.....	\$2,437,325	\$2,188,259
1887.....	1,531,140	2,376,611

As the proposed lowering of the Chilean duties would favor our goods particularly, we have fair chances for a decided increase in trade in that direction.

The American Institute of Mining Engineers are holding their fifty-fourth meeting this week in Colorado, the session having begun at Denver on the 18th inst. The annual convention for 1889 of the American Society of Civil Engineers began its session at Seabright, N. J., to-day. Many of the most active and prominent members of these engineering societies are at present in Europe.

The American Exchange Bank Loses.—An important decision was handed down by the Court of Appeals in the case of Marshall Cutler and others against the American Exchange National Bank, in which they affirmed the judgment of the Superior Court of New York in favor of the plaintiffs. The action was brought to recover \$500 from the bank upon a letter of advice. The plaintiffs, on July 20, 1883, deposited with the defendant bank \$500 for the purpose of having it transmitted to Leadville, Col., and received for that purpose the letter of advice, which represented on its face that \$500 had been deposited with the defendant bank to the credit of the bank in Leadville for the use of J. Seymour Hall. The plaintiffs took the paper, and before it could be presented to the bank of Leadville it failed. The failure took place on July 26. A receiver was appointed who refused to pay the \$500 deposited. Suit was then brought by the plaintiffs to recover the amount in suit from the defendants, who refused on demand to return the money. The bank's defense was that as the plaintiffs had accepted the letter of advice, which said that the money was deposited to the credit of the bank of Leadville, they were estopped from denying that the money had actually come into the possession of that bank. The Court of Appeals has now affirmed the decision of Judges Sedgwick and O'Gorman in favor of the plaintiffs.

During the month of May the two stacks of the Isabella Furnace Company, at Etna, Pa., produced 13,070 tons of 2268 pounds of No. 1 foundry pig-iron. This is the largest production for the same length of time in the history of the furnaces.

Our Production of Gold and Silver.

The report of Dr. James P. Kimball, Director of the Mint, has just been issued. From it we take the following statements relative to the production of gold and silver in this country in recent years:

The produce of gold from mines in the United States during the calendar year 1888 is estimated to have been 1,604,841 fine ounces (49,917 kg.), of the value of \$33,175,000.

Messrs. Wells, Fargo & Co., in their annual statement, estimate the gold produce of the States and Territories of the United States west of the Missouri River as \$29,987,702 in 1888, which is considerably less than the estimate of this bureau. Their estimate for 1887, of \$32,500,067, agreed substantially with that of this bureau, the latter being, for the whole country, \$33,000,000.

The value of the gold produced in the United States annually since 1880, according to the estimates of this bureau, is exhibited in the following table:

Years.	Weight, fine ounces.	Value.
1880.....	1,741,500	\$36,000,000
1881.....	1,678,612	34,700,000
1882.....	1,572,187	32,500,000
1883.....	1,451,250	30,000,000
1884.....	1,489,950	30,800,000
1885.....	1,538,325	31,800,000
1886.....	1,693,125	35,000,000
1887.....	1,596,375	33,000,000
1888.....	1,604,841	33,175,000

The produce of silver from mines in the United States during the calendar year 1888 is estimated to have been 45,783,632 fine ounces (1,424,326 kg.), of the coining value of \$59,195,000.

This is an increase of 4,515,327 fine ounces over the estimated production for 1887.

The elimination from an estimate of the produce of our own mines of the value of foreign material, consisting principally of refined silver obtained from crude silver, base bullion, and miscellaneous smelting ores imported from Mexico, has been attended, as in the last few years, with no little trouble.

The influx into the United States of such silver products in considerable quantities for reduction and refining, beginning in 1885, has since steadily increased, owing to the extension of railways into Mexico, and very largely to the fact that most of the silver-bearing ores are rich in lead, which, under rulings of the Treasury Department, is free of duty when contained in ores in which the precious metals constitute the predominant value.

So important has it become to identify and eliminate for statistical purposes this foreign product from the produce of our own mines that custom-house officers on the Mexican frontier and on the Gulf have been required to furnish this bureau with monthly statements showing in detail the class of material imported and the names of consignees.

According to custom-house returns the value of silver bullion imported into the United States during the last calendar year was \$5,977,036. This value of silver bullion is understood to be the commercial or market value, in which terms silver imports are manifested.

Of this foreign silver bullion \$5,054,402 was from Mexico, and most of the remainder from the United States of Colombia, with a small value from Honduras, and a smaller value from the British possessions in North America, and from Cuba.

In addition to the imports of foreign silver bullion, silver ores were imported of the declared commercial value, according to custom-house returns, of \$5,684,093. Most of these ores were imported through the ports of entry of the customs district of Paso del Norte. The collector of cus-

toms at El Paso informs the bureau that of the declared value of silver ores imported in his district during the year the value of the gold contained was \$16,313 of the lead \$832,944, and of copper \$1870.

These figures are the more useful as measures have been adopted in the customs district of Paso del Norte to verify by assay the important mineral and metallic products from Mexico entered at the several custom-houses.

Deducting the value of the gold, lead and copper contained in silver ores, the commercial value of the silver contained in ores imported was \$4,832,966.

Of the silver ores imported the value of \$4,450,363 was from Mexico, \$1,208,190 from the British possessions in North America, the remainder being small lots from various countries.

The total commercial value of foreign silver bullion and of silver contained in foreign ores imported into the United States during the calendar year 1888 was therefore, according to custom-house reports, \$1,810,002. The average price of silver during the year, based upon daily cable dispatches from London to the bureau of the Mint, was 42.869d per ounce British standard, equivalent, at the par of exchange, to \$0.93,974 per ounce fine. For the purposes of this report the average price is taken as \$0.93 per fine ounce. At this value the silver imports contained 11,500,000 fine ounces, worth at coining rate in silver dollars \$14,868,686.

The production of silver in the United States since 1880 is exhibited in the following table:

Years.	Fine ounces.	Coinage value.
1880.....	30,318,750	\$39,200,000
1881.....	33,257,812	43,000,000
1882.....	36,196,875	46,800,000
1883.....	35,732,812	46,200,000
1884.....	37,743,750	48,800,000
1885.....	39,909,375	51,600,000
1886.....	39,445,312	51,000,000
1887.....	41,268,305	53,357,000
1888.....	45,783,632	59,195,000

Dr. Kimball has made the following estimate of the world's production of gold and silver in 1887, gathering the information from a great variety of sources. A kilogram of gold is equal to \$664.60; of silver, \$41.56. The coining rate of silver is in United States silver dollars:

Countries.	1887.			
	Gold.		Silver.	
	Kilos.	Dollars.	Kilos.	Dollars.
Unit'd States	49,654	33,000,000	1,283,855	53,357,000
Australasia.	41,119	27,327,600	6,422	266,500
Mexico.....	1,240	824,000	904,000	37,570,000
European countries:				
Russia.....	30,232	20,092,000	13,522	562,000
Germany.....	2,251	1,496,000	23,929	994,500
Austria.....	1,877	1,247,450	53,391	2,218,900
Hungary.....	84	55,550	5,828	242,250
Sweden.....	.....	.....	7,200	299,000
Norway.....	195	129,000	38,899	1,606,350
Italy.....	.....	.....	54,335	2,258,000
Spain.....	10	7,000	3,323	55,000
Turkey.....	.....	.....	46,789	1,944,550
France.....	2	1,000	9,964	414,100
Great Britain.....	2,061	1,390,700	10,865	451,550
Dominion of Canada				
South American countries:				
Argentine Republic.	45	30,000	722	30,000
Colombia.....	4,514	3,000,000	24,061	1,000,000
Bolivia.....	109	72,000	240,616	10,000,000
Chili.....	2,395	1,591,400	205,452	8,537,350
Brazil.....	1,532	998,000	141	5,850
Venezuela.....	5,030	3,396,000	.....	.....
Peru.....	170	113,000	40,750	2,067,650
Central American countries:				
Costa Rica.....	131	87,000	.....	.....
Honduras.....	.....	.....	1,790	74,750
Salvador.....	100	66,400	5,774	240,000
Japan.....	564	375,000	32,065	1,332,650
Africa.....	2,888	1,919,600	432	17,900
China (Amoor district).....	5,068	3,368,500	.....	.....
India (British).....	481	320,000	.....	.....
Total.....	151,712	100,826,800	3,016,044	125,346,310

Business Courtesy.

If it were possible to determine the money value of business courtesy the majority of people would be wonderfully surprised to find at how high a figure it was rated; and stranger yet, if this same quality could be gathered up or manufactured into a marketable form, we believe that it would find very few purchasers. In other words, courtesy is a something the worth of which is little appreciated, and most people would not care to take it even as a gift. How important a factor it is in the general affairs of life is not a question to be discussed in a trade paper, but on the other hand, it is eminently proper to point out the influence of this personal ingredient in the business world. Furthermore, the subject is especially pertinent just now, when the celebration of the centennial anniversary of General Washington's inauguration is turning men's thoughts back to the customs of the last century. To be sure, the chief attention is given to the military ways of our ancestors, but along with this there is a good deal of investigating into the every-day habits a hundred years, more or less, ago. Whoever looks up the history of business and reads old correspondence and papers relating to past methods of trading cannot but be struck by the more dignified and courteous tone that pervaded the dealings of the merchants then, and if the written records they have left are marked by an old-fashioned courtesy we can depend upon it that the manners of the day possessed the same charm. Is is no excuse to say that business men of the present are subject to such fierce competition and are so driven in their work that they have no time to waste in being courteous, for a gentlemanly manner will facilitate rather than delay a trade, even if it is but swapping jack-knives. Furthermore, as there is little prospect of the hurry of business life abating yet awhile, we should be all the more careful to guard against the consequences that come from fret and worry, lest our future behavior become intolerably rough.

Looking at the matter simply from a mercenary stand-point, it will require but little reflection on the part of sensible people to discover that courtesy in business brings an actual money reward. There is no one but can recall instances in his experience where the manner of a salesman had as much to do with a bargain as the quality of the goods. It would seem to be true, however, that this personal element enters with greater force in small transactions than in large ones, for where considerable money is involved we are less influenced by our feelings in the matter. A pleasant address will win a fortune for a book agent, while the president of a big corporation can be as crotchety as he pleases without coming to bankruptcy. Nevertheless, the amount of business lost through the offensive behavior of a company's agents is an indeterminate factor, and very likely it is the difficulty of estimating the losses from this cause that makes us undervalue it. If, as not infrequently happens, we are kept from purchasing a lot of goods or from awarding a contract by a disagreeable manner, we are not apt to tell the person the reason why we do not trade with him, and such people are seldom modest enough to divine our motives. But if it is the price of the work or quality of the goods that deter us, we have no hesitation in letting our reasons be known. In the first instance, the man injures his interests without knowing how, and we will likely repeat the folly many times over, while in the second case we have cited the obstacle to the trade is understood and can readily

be removed. As we intimated above, the influence of courtesy increases as we approach the last division in the distributing trade, and is greatest with the retail salesman, but in every department of business it is too important a factor to be ignored. It is extremely difficult to write about this subject in a general way, and it would require an infinite number of practical illustrations to cover the whole field. The best we can hope to do is to direct attention to it, and let each one reason out for himself the money value of business courtesy. After all, courtesy is much like advertising; we know that it is a good thing, but cannot tell exactly how many dollars it is worth to us.

The Wrecked Pennsylvania Bridges.

Iron structures will replace the wrecked bridges of the Pennsylvania Railroad on the Juniata River. The principal bridges are the Granville Bridge, near Lewistown Junction. It is 640 feet long, iron, and of 5 spans, four of which were completely washed away. May's Bridge, two miles west of the Granville Bridge, 5 spans and 640 feet long, was completely wrecked and a new bridge will have to be built. The Manayunk Bridge, two miles west of McVeytown, was wrecked, and a new one of iron will be erected in its place. It is 640 feet long and has 5 spans. Besides these there are a number of one and two span bridges which have been more or less injured, and in all cases they will be repaired by the substitution of iron ones. Petersburg Bridge, near Shafer's Station, is a complete wreck. It is only 156 feet long, and was supposed to be strong enough to withstand the heaviest kind of a freshet. The Montgomery Bridge, which crosses the North Branch of the Susquehanna 22 miles from Sunbury, has just been repaired after nine days of hard work, but a new iron bridge will be erected. Shuman's Bridge, near Tyrone, is 310 feet long. A new iron bridge will be erected in its place. The Viaduct Bridge was a magnificent one-arch stone structure 80 feet long, about eight miles east of Johnstown. It was built by the State in 1832 and has stood many an uprising of the waters. It was considered a fine work of mechanism, but the last rise in the waters around Johnstown was too much for it and it succumbed with the weaker bridges. A new bridge of stone will be erected in its place. Little Conemaugh Bridge No. 6, just east of Johnstown, an iron bridge of 2 spans, was totally washed away. A new one of stone will be erected in its place. South Fork Bridge, which crosses the Conemaugh River near South Fork, was an iron bridge of 2 spans. It was washed away and a new stone bridge will take its place. An official of the company said: "It has been our policy for the last few years to erect stone bridges wherever practicable, and as we have the chance to do so we will carry out our intention. Wherever the ground will permit we will hereafter erect a stone bridge."

The Chain and Nail Trades.

The condition of the chain and nail trade workers, says the *London Engineer*, is an illustration of the terrible effects of unlimited and misguided competition for work among wholly uneducated work-people. Individual has conflicted against individual, until the work of each chain and nail maker is the work of a slave in a slavery of his own making and in a den of his own defilement. Publicity is creating a disposition to remedy this deplorable state of things. That the statements which have hitherto been made have in no way overdrawn the picture is evident from the annual report of

the chief inspector of factories. With reference to the operative chain-makers, the inspector states that while, after the prolonged strike of 1887, the chain-makers returned to work at the 4/ list—i. e., 4/ for making 1 cwt. of $\frac{1}{4}$ -inch chain—at which price a steady man could earn 25/ a week, yet, to get iron out of the warehouse, too many would undertake to do it for less, and had gone so far as to undertake making it at as low a figure as 1/9 per cwt. This, it is easy to calculate, would reduce wages to below 12/ a week. With reference to the nail-makers, the report is fully confirmatory of all that has previously been said upon this subject. As instances of low wages, a case is quoted where a woman made 5000 hob-nails in a week, for which she got 2/7 $\frac{1}{2}$, and this was a good week's work, considering that house and children had to be looked after. In another instance a worker gets 2/6 a bundle for making rivets, and can in a full week earn 4/. Another gets 3d for making 12 dozen "tangs," and has to work hard to make 5/ a week. A man making $\frac{1}{4}$ -inch chain, working about 67 hours a week in front of a hot fire, can clear 12/ a week. It has been suggested that the chain shops should be closed by act of Parliament at 6 p.m., to prevent excessive labor and also competition from colliers and other outsiders. As to the nail trade, that is undoubtedly a declining industry; but there seems to be no reason why a more speedy termination should not be put to hand labor by the more extensive and rapid introduction of machinery.

A large section of the manufacturing district of lower Jersey City was wiped out by fire Tuesday night. The fire originated in a small structure in the rear of N. B. Cushing's machine works, a five-story brick building, near the piers and yards of the Red Star and Inman steamships, and all were burnt. William Brown's boiler works, a two-story frame building, was next destroyed. At the same time Tooker & Sayre's syrup refinery was burned. The Wallis Iron Works, a two-story frame building opposite Cushing's, were ignited. Cushing's building cost \$55,000. The machinery and stock were worth fully \$100,000 more. The loss on the refinery building and stock is estimated at \$125,000. Brown's boiler shop was damaged about \$10,000 and the Wallis Iron Works about \$3000.

The annual meetings of the Duluth and Iron Range Railway and Minnesota Iron companies were recently held at Duluth, Minn. In the railroad company the only changes were the election of M. J. Carpenter as vice-president and director, in place of R. H. Lee, and D. H. Bacon director, in place of Samuel P. Ely. In the iron company the only change was the election of R. H. Lee as director and member of the Executive Committee, in place of C. Tower, Jr. The surplus for the year, \$1,300,000, was voted to be used at the discretion of the Executive Committee for the improvement of the property. It is learned, though not officially, that this means no less than the building by the company of a line of vessels to carry their ore.

Judge Advocate General Rogers, of the Johnstown Bureau of Information, now estimates that not over 4000 lives were lost in the flood. He bases his calculation on the census returns and the reports which have been made to his office. He thinks that the number given will certainly cover the loss, and that it may be as low as 3000. This varies widely from the estimates made a week ago, that the total number of lives lost would be from 12,000 to 15,000.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 230 South Fourth St.,
PHILADELPHIA, Pa., June 18, 1889.

Pig-Iron.—The market has been very active during the past week, and a great many lots are believed to have been arranged for on private terms. A considerable business has been done at prices fractionally higher than last week's quotations, while in other instances the quantity called for was cut down about one-half before the sellers would agree to close the contract. From this it will be seen that the change of feature intimated in our recent reports has become more pronounced, so much so, in fact, that the market may be called strong, with an advancing tendency, and that without any qualification whatever. Of course it is not expected that there will be any great boom in Iron, but the advance which now averages 50¢ per ton may easily be increased to \$1 within a few days, and for some brands possibly a trifle more than that. But in many cases prices were ruinously low, and as the cost of production is said to be a full 50¢ more than it was a month ago, sellers have not reaped much benefit from the advance so far. The more hopeful feeling, however, is due to the fact that there is no difficulty in finding buyers at current rates and in the belief that the period of extreme depression has been passed, and that still further improvement in values is only a question of time. The great difficulty to-day would be to find some one willing to quote on anything like large lots. Regular customers are favored with their usual quantities for prompt delivery at, say, \$14.75 @ \$15 for good Gray Forge; \$16 @ \$16.50 for No. 2, and \$17 @ \$17.50 for No. 1. It would have to be a very good buyer or a brand of secondary character at the inside quotation, while large orders would not be accepted at the outside figure unless for very early deliveries. Southern Irons have been largely sold presumably at about \$14, ex-ship, for No. 1 Mill, said to correspond with Pennsylvania Gray Forge. Foundry grades are held at figures nearly approaching to those asked for local Irons, but some of the largest concerns have withdrawn from the market, so that prices are more or less nominal.

Blooms.—The market is unsettled and prices hard to quote, as some of the leading sellers are out of the market. Others ask an advance of 50¢ @ \$1 per ton, while still others profess to accept orders from their customers at the old prices. Several large sales are reported, but prices have not been made public. We repeat last week's quotations, although in the present condition of the market the outside figures would probably be required in the majority of cases, viz: \$28 @ \$28.50, at mill, for Nail Slabs; \$30 @ \$31 for Tank Slabs; \$32.50 @ \$33.50 for Shell Slabs; \$36 @ \$37 for Flange, and \$38 @ \$40 for Fire-Box; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 per "Bloom" ton of 2464 lb.

Muck-Bars.—The same unsettled feeling may be noticed in this department. Sales have been made as high as \$28, delivered, some holders now quoting \$28.50. There is a good deal of inquiry, but very few sellers, hence the feeling is one of much firmness, although the advance is thought to be somewhat extreme compared with that in other specialties.

Bar-Iron.—While there is a much firmer feeling in Bars prices have not advanced, as might have been expected, considering the movement in other depart-

ments. Some of the best brands are held at 1.85¢ @ 1.90¢, but others are still hanging around 1.75¢ @ 1.80¢, with certain Western makes available at still lower figures. There is a gradual increase in the volume of business, however, and as soon as the many little country mills get filled up with work more uniformity in prices is expected. Skelp Iron shows some improvement in demand, but prices remain at about 1.75¢ for Grooved and 1.95¢ @ 2¢ for Sheared. The actual change in prices since last week is very trifling, but the increase in demand is considered a strong feature, and will doubtless develop into higher prices before long.

Plate and Tank Material.—The demand has been largely in excess of the supply, so that prices have shown a steadily-hardening tendency. All descriptions have been called for, and mills are now full of work for some weeks to come. Prices are higher, but vary according to circumstances and according to the way certain mills are situated for making deliveries. In a general way the following inside quotations represent prices f.o.b. cars at mills, and the outside figures are for deliveries in consumers' yards: 2¢ @ 2.2¢ for Ordinary Plates and Tank Plates; 2¢ @ 2.25¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.25¢; Fire-Box, 3.7¢ @ 4¢; Steel Plates, Tank and Ship Plate, 2.2¢ @ 2.30¢; Shell, 2.5¢ @ 2.7¢; Flange, 2½¢ @ 3¢; Fire-Box, 3½¢ @ 4¢.

Structural Material.—Business has been very active in this department, mills all full of work, with prices firm and advancing. Beyond that there is nothing more to be said, except that prospects are decidedly favorable and that work during the summer is likely to be abundant. Quotations are about as follows: Bridge Plate, 2.05¢ @ 2.15¢; Angles, 2.1¢ @ 2.2¢; Tees, 2.5¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet-Iron.—There is all the business that mills are inclined to accept at present prices. The feeling is firm, and it is believed that some advance will be made soon, but in the meantime prices are about as follows for carload lots:

Best Refined, Nos. 14 to 20.....	3¢
Best Refined, Nos. 21 to 24.....	3.20¢
Best Refined, Nos. 25 to 26.....	3.40¢
Best Refined, No. 27.....	3.50¢
Best Refined, No. 28.....	3.60¢
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3¼¢
Best Soft Steel, Nos. 21 to 24.....	3½¢
Best Soft Steel, Nos. 25 to 26.....	3¾¢
Best Soft Steel, No. 27.....	4¢
Best Bloom Sheets, ¼¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	65 %
Common, discount.....	67 %

Steel Rails.—The market is dull but firm at \$27.50 @ \$28 at mill. Sales during the week have not been important, but there is plenty of work on hand for the present, so that there is no disposition to shade quoted rates. Prospects are considered to be favorable for a further stiffening in prices, as there is a considerable amount of business to be placed during the summer months.

Old Rails.—Prices are entirely nominal at about \$22.50, spot, Philadelphia, or \$23 @ \$23.50 delivered in the interior. There is but little inquiry, and an equally light supply.

Scrap-Iron.—Prices are firm and the supply of good Scrap decidedly scarce, but no quotable change can be made at present, although sales are chiefly at outside figures, as follows: \$20.50 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$16.50 @ \$17.50; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish-Plates, \$23 @ \$24; Old Car-Wheels, nominal, \$17 @ \$18, Philadelphia.

Wrought-Iron Pipe.—The demand is very active and prices are firm, with an advancing tendency, although discounts for the present remain as before, viz.: Butt-Welded Black, 52½ %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 52½ %; Boiler Tubes, 60 %.

Nails.—There is a pretty good demand from the building trade and a very active one from speculators. Mills limit sales to their regular customers and claim \$1.90 to be an outside price for carload lots. Store prices are about \$2.

Mr. Wm. H. McElroy, for the past 12 years with the Phoenix Iron Company, at their works, Phoenixville, Pa., has resigned his position to enter into the Iron and Steel commission business with R. E. Anthony, Jr., of Brooklyn, N. Y., and has secured offices at 328 Chestnut street, Philadelphia.

Chicago.

Office of *The Iron Age*, 50 Dearborn street,
CHICAGO, June 17, 1889.

Pig-Iron.—The only change in the condition of the market as described a week ago is in Southern and Ohio Irons. Local furnaces have been selling at figures that made it absolutely impossible to sell outside Coke and Charcoal Irons here at a profit. Manufacturers recognized this fact, and nearly every sales-agent handling Southern grades has been notified that the furnaces are "sold up"—better prices being obtained in other markets. In many instances extra concessions on immediate shipments were offered them by their local branch roads, which it was hoped, with the new freight rate, would help the maker in placing some of the surplus stock, but local furnace men have the advantage under all circumstances, and they intend keeping it so long as they have a ton of Iron to sell. In Soft Irons, Gray Forge and Mottled used in mixtures there is no local competition, and manufacturers were free to take in a good many orders. The demand was very free and prices consequently advanced from 25¢ to 50¢ per ton. On this grade of Iron we change quotations accordingly, but on Saturday it was rumored that railroads fighting for business had made a cut of 35¢ per ton from Birmingham, making the rate \$3.65, as against \$4. If this rumor proves correct our prices will be that much above the market. Transactions in Coke and Charcoal Irons were frequent and no concessions made for quantity. Long-time deliveries are not accepted so ravingly as some weeks ago and command the top price. Car-Wheel Irons have been in better request, but sales were not augmented to the extent anticipated. A very small proportion of the cars contracted for came to this vicinity, hence no extra amount of Iron was required for Wheel purposes. We make the following quotations, cash, f.o.b. Chicago: Lake Superior Charcoal, \$18.50 @ \$19; Local Coke, No. 1, \$15.50; No. 2, \$14.50; No. 3, \$13.50; Chicago and Bay View Scotch, \$15.50 @ \$16; American Scotch (Blackband), \$18; Southern Coke, No. 1 Foundry, \$15.75; No. 2 Foundry and No. 1 Soft, \$15.25; No. 3 Foundry, \$14; No. 2 Soft, \$14.25; Gray Forge, \$13.00; Mottled, \$13.25; Hanging Rock, No. 1, \$18.25; Jackson County Silvery, No. 1, \$18; Tennessee Charcoal, No. 1, \$18.75; Alabama Car-Wheel, \$24 @ \$25.

Bar-Iron.—As the end of the month approaches manufacturers are becoming more chary about taking orders at any price. Some of the mills East and West have declined to bid on specifications for July, August and September deliveries, and all those who do name prices all the way from \$1 to \$2 per ton higher at mill. Prices are nevertheless irregular and vary

according to quality and uses. On Common Bars, \$1.60, and on Single Refined, \$1.75, including half extras, f.o.b., Chicago, is a general quotation made by the lowest sellers. Mills having begun to show a little firmness, buyers are placing their orders more rapidly and inquiries are not falling off. Best Refined is not getting its share of attention. There are a good many consumers who hesitate about placing their full orders with the cheap makers and only one mill. Out of store jobbers quote Common and Single Refined at \$1.65 @ \$1.75, and the better grades at \$1.80 @ \$1.90.

Structural Iron.—It now looks as though there would be a very fair trade in Builders' Shapes during the summer and early fall. Foundries are all pressed for estimates and quite a lot of little contracts are made every week. Several large structures—one 10, another 12 and another 14 stories—are under negotiation, and operations are to begin soon. Bridge Material for new and repair work is in good request. On these prices may be a shade firmer, but unchanged in quotations, as follows, f.o.b. Chicago: Angles, 2.10¢ @ 2.12½¢; Universal Plates, 2.15¢; Sheared Plates, 2.20¢; Tees, 2.55¢; Beams and Channels, 2.90¢. Small lots from store are quoted at 2.20¢ @ 2.30¢ for Angles, 2.65¢ @ 2.70¢ for Tees and 3.40¢ for Beams.

Plates, Tubes, &c.—Jobbers report no change in the general condition of the market. Consumption is confined to small-lot buyers. Large orders for new work are talked of but not placed. Prices remain quite steady on Iron and Steel Plates and advanced on Tubes. The following quotations from store are made: Nos. 10 to 14 Iron Sheets, 2.50¢ @ 2.60¢; Nos. 10 to 14 Steel Sheets, 2.75¢ @ 3¢; Tank Iron, 2.40¢ @ 2.50¢; Tank Steel, 2.50¢ @ 2.60¢; Shell Iron or Steel, 3¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler Rivets, 3.75¢ @ 4.25¢; Boiler Tubes, 55 % off for 1½-inch and less and 60 % off for 2-inch and larger.

Sheet-Iron.—Because manufacturers do not want additional orders the impression prevails that there will be some labor trouble in the Sheet mills next month. Jobbers who have stock under contract are pressing for deliveries and holding prices firm. From store they quote on a basis of 2.20¢ for No. 27, and mills quote on the same basis and number 2.90¢ @ 2.95¢, f.o.b. Chicago.

Galvanized Iron.—The market continues to be in about the same condition as a week ago. Orders are quite numerous in small lots, but heavy buyers are not placing their orders. Stocks in all sizes are in good supply and prices pretty closely adhered to. On Juniata jobbers quote 65 % off and on Charcoal 65 % and 5 % off.

Merchant Steel.—Low-grade Steels continue to have the call. Consumers begin to realize that the chances for lower prices are very slim. While that class of manufacturers who do not make stock goods are not inclined to buy heavily, they nevertheless are stocking up gradually and accumulating from time to time a little more material than their immediate wants require. A good many of the agricultural implement men have placed their orders for the next year's supply, but there are still many who are waiting for further indications that prices have reached bottom. The Chicago office of the Gautier Steel Department have issued a circular in which they say: "We shall be prepared in 30 to 45 days to fill any orders you may favor us with for Tire, Machinery, Toe-Calk and Spring Steel; also for Finger-Bars, Rake-Tooth Steel and Finished Rake Teeth, Bundle-Carrier Teeth, &c." If they can do this, it will have a

tendency to divert some of the orders on which inquiries have been made in this market recently. Manufacturers quote f.o.b. Chicago on round lots of Open-Hearth Spring Steel, 2.25¢; Open-Hearth Machinery, 2.10¢; Tire Steel, 2.15¢; Toe Calk, 2.30¢, flat; Soft Bessemer Steels, 1.90¢ rates. The following quotations are from store: Mixed Machinery Steel, 2 10¢ @ 2.20¢; Tool Steel, 7.75¢ @ 8.50¢; Specials, 12¢ @ 25¢; Crucible Spring Steel, 3.50¢ @ 3.60¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.50¢ @ 3¢; Bessemer Machinery, 2.30¢ @ 2.40¢; Sheet-Steel, 7¢ @ 10¢; Tire Steel, 2.20¢ @ 2.25¢.

Track Supplies.—The demand for this class of shapes has not run into large orders. Prices on Fish-Plates vary with the quantity and time of delivery from 1.70¢ to 1.90¢. Bolts with Square Nuts are quoted at 2.50¢; with Hexagon Nuts, 2.60 @ 2.70¢; Spikes, 1.85¢ @ 1.90¢; Hot-Pressed Square Nuts, 5.85¢ discount; Hexagon Nuts, 6.35¢ discount.

Steel Rails.—The demand for Steel Rails in the past week has been very slow. Railroad companies that were greatly in need of Rails got into the market early in the month. The mills here are consequently filled up entirely for June and July. The C., R. I. & P. R. R. Co., it is said, will build a line of 100 miles through the Oklahoma Territory, for which they will need a quantity of new Rails. There are several other new branches spoken of, but so far as known none are ready to contract for the necessary supplies. On Heavy Sections mills continue to quote \$29 @ \$30. There has been considerable demand for Light Iron Rails for street car purposes. On 12-lb Rails manufacturers are asking \$34 @ \$36; on 30-lb Rails, \$33. This is a slight advance over prices of several weeks ago; \$32 was refused on a 100-ton lot within the last week.

Old Rails and Wheels.—The demand for Old Rails has been quite brisk, but sales very limited. In the first place stocks are scarce in this market and those who have Rails to sell are inclined to hold them for higher prices. On small lots \$20.25 has been offered. Sellers are asking from \$20.50 to \$23. The demand for Old Steel Rails is not urgent and prices are nominally quoted at \$17 @ \$18 for long lengths and \$14 @ \$15 for short pieces. Old Car-Wheels are in pretty good demand, but the exalted idea of their value on the part of sellers has thus far prevented any large sales. Offers of \$17 @ \$17.50 have been made by buyers, but the asking price ranges from \$18 to \$19.

Scrap.—There appears to be a little more activity in the Scrap market. Sales of 1000 to 1500 tons Wrought Scrap are reported. Railroad companies are offering only small lots, and dealers are holding their prices a trifle stronger than several weeks ago. Manufacturers do not take hold in very large quantities and are inclined to discredit the probability of prices advancing. Dealers' quotations on 2000 lb are as follows: No. 1 Wrought, \$17.50; Fish-Plates, \$18; Axles, \$21; Horse-shoes, \$17; No. 1 Mill, \$13; Cast Machinery, \$11; Stove Plate, \$9; Cast Borings, \$8; Wrought Turnings, \$10; Coil Steel, \$13; Leaf Steel, \$14.50; Locomotive Tires, \$14.50; Track Scrap, \$16; Mixed Country Wrought, \$12.

General Hardware.—Nothing of importance has transpired since our last report. The leading jobbers of this city are doing a very nice trade in Shelf Goods and other staple articles. The demand for Heavy Hardware is lighter. No new prices were announced during the week and all the advances heretofore made are being well sustained.

Nails.—This market is so unsettled that it is difficult to express an opinion which will give a definite idea of the situation. The manufacturers who are selling Nails at the ruinous prices of a week ago have withdrawn from the market, but in their stead we find another set of men who have taken offence at the action of their brethren, and are now preparing to (if not already doing so) discount the price at which Nails have been sold. As they recognize that most of the jobbers have obtained pretty large supplies, and that they cannot do much in a jobbing way, they intend going direct to the large retailers throughout the country soliciting carload orders. The unprecedentedly low freight rates from Pittsburgh, Wheeling and Ohio Valley to St. Paul and Missouri River points makes it possible for goods to be shipped into those sections at nearly the same prices for which they can be laid down in Chicago. Should they proceed in their undertaking they will through this means be able to stock up all the principal dealers in the West. This will result in arousing the jobbers, who undoubtedly will meet whatever prices are made by the manufacturers. Under the disturbed condition of the market the majority of dealers would not feel inclined to take full carloads, which would exclude the manufacturers and leave the jobbers an opportunity of selling small lots or mixed cars at the same price the manufacturer had named, and in a measure deprive him of some trade. From stock jobbers are quoting \$1.85 for Cut Nails and \$2.30 for Wire Nails. Mixed carloads in small lots Cut Steel Nails are quoted at \$1.90 and Wire Nails at \$2.35. It is not surprising that Wire Nails are suffering from the demoralized condition of the Cut-Nail trade. Manufacturers readily see that in order to compete with the Cut Nail it will be necessary for them to reduce their prices. This has not yet been done, but there is a probability that lower prices will be made before the close of the week. Manufacturers of Wire Nails are making an effort to have the jobbers adopt their last price-list on small goods. The jobbers are making serious objections to it, and it is not likely that it will come into operation.

Barb-Wire.—The conditions of the market remain precisely the same as heretofore. Manufacturers in the West are running their mills full on orders and not accumulating any stock. Jobbers' price in small lots from store is 2.75¢ on Painted and 3.35¢ on Galvanized. Some of the Eastern mills evidently are not so well situated, as we hear of orders of carload lots delivered on the Mississippi River at about the same figures that jobbers are asking here in carloads. Here also comes into play the discrimination in favor of Eastern manufacturers on through freight rates, which enables them to lay down Wire in Duluth as cheaply as they could in Chicago.

Pig-Lead.—There was no activity in the market last week, buyers apparently waiting for a change in the situation. Consumers are pretty well supplied for June and July, and there is no hurry in placing orders for August. Sales amount to about 200 tons at 3.80¢ @ 3.85¢, which was the ruling price at the close of the week.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, June 17, 1889.

Pig-Iron.—There appears to be an improvement all along the line in the tone of the market. No concessions are now being asked by buyers, and sales are being made on a basis of previous prices to an advance of 25¢ @ 50¢, so that upon the whole there is really an advance in the condition of the market. Anything like making a purchase of a round lot for future

delivery—that is to say, for a stated amount per month during the year—is now out of the question; it would take an advance of at least \$1 @ \$2 per ton to secure such a contract. None of the furnaces are suffering for orders, and it is safe to say that at prices that have ruled during the past few weeks there is not a furnace South but what could close out its entire output for the balance of the year. The above describes about the situation with the Southern Iron makers, and the future is being watched with much interest. A reduction in rates to some points North has been made, but how many points are affected is not yet known.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave. {
PITTSBURGH, June 18, 1889. }

In regard to the hitch between the Iron manufacturers and the Amalgamated Association there has been nothing of a decisive character developed as yet. The manufacturers have no organization, and the wage-scale agreed upon by the Amalgamated Association, which it is believed will be substantially the same as that of 1888-89, will be presented to each firm by the Mill Committee, and the indications at the present time are that the manufacturers generally will sign, and consequently there is not much probability of a strike. Our manufacturers say they cannot compete with Eastern manufacturers, who have a great advantage in the matter of wages. It is generally admitted that in regard to the wage-scale the Amalgamated Association display a good deal better generalship than the manufacturers, who for a year or more have had virtually no organization, and, of course, without organization there could be no co-operation; on the other hand, the Amalgamated Association are well organized, and consequently they have a decided advantage.

Our communication with the East via the Pennsylvania Railroad is again opened up, so far at least as relates to passengers and mail, but it will be some days yet before freight trains will be put on; in the course of another week, however, it is expected that the road will be in pretty good condition for business, but it will be a long time before the damage in the Conemaugh Valley is fully repaired. The railroad officials, it is understood, estimate the actual loss to the road at \$1,500,000, but this does not include the loss of business while the road is in its disabled condition, which will also be very heavy. However, while it is bad for the company it will make a largely increased demand for all kinds of Railway Supplies, Rails, &c. Bridge-builders also will come in for some pretty good-sized contracts. Moreover, the rebuilding of Johnstown and suburbs, both as to dwellings and manufacturing establishments, has already been commenced, which will require large quantities of Iron and Steel, to say nothing of machinery.

Pig-Iron.—There has been more activity the past week, with more buyers and fewer sellers, and while prices are not notably higher, the market is firmer. The feeling generally obtains that hard pan has been reached, and furnacemen are refusing to make contracts for future delivery at present rates. While sales of Bessemer have been reported for immediate or near-by delivery at \$15.75 and even \$15.50, furnace men are asking from 50c. to \$1 more for delivery during July or August. We quote prices as follows:

Neutral Gray Forge.....	\$13.85 @ \$14.00, cash
No. 2 Neutral Gray Forge.....	\$13.50 @ \$13.75, "
All-Ore Mill.....	14.50 @ 15.00, "
No. 1 Foundry.....	16.00 @ 16.25, "
No. 2 Foundry.....	15.00 @ 15.25, "
No. 3 Foundry.....	14.50 @ 14.75, "
White and Mottled.....	13.00 @ 13.50, "
No. 2 Charcoal Foundry.....	21.00 @ 22.00, "
Cold Blast Charcoal, No. 1.....	24.00 @ 27.00, "
Bessemer Iron.....	15.75 @ 16.00, "

Muck-Bar.—There is more inquiry and the market is firmer. We now quote at \$26 @ \$26.25, cash, with a sale of 1000 tons reported at \$26.25, cash. Manufacturers say there is nothing in it at present prices, and some of them are indifferent about selling.

Manufactured Iron.—The mills generally are pretty well employed, but there is no rush and no improvement in prices. First-quality Iron is still quoted upon a basis of 1.60¢ @ 1.70¢ for Bars, 60 days, 2 % off for cash, but Old Rail Iron can be had for from $\frac{1}{2}$ ¢ to $\frac{3}{4}$ ¢ less. There is a continued good demand for Skelp Iron, and prices are steady at 1.60¢ @ 1.65¢ for Grooved and 1.90¢ @ 1.95¢ for Sheared.

Nails.—The Nail trade continues unsettled and somewhat demoralized. What has been known as the Western Association has collapsed, and each firm is now free to do as it pleases. There are no regularly established prices, although makers continue to quote at \$1.80 @ \$1.90, 60 days, 2 % off for cash. Manufacturers, it is said, succeeded in unloading from 15,000 to 20,000 kegs at Chicago last week at very low prices. A firm having over 100 machines who wanted to go out of business offered to sell the whole lot at \$20 for each machine. Wire Nails are still quoted at \$2.25, 60 days, 2 % off for cash.

Wrought-Iron Pipe.—The meeting of the Pipe manufacturers in this city last week was largely attended, nearly all the mills in the country having been represented; business was very generally reported good; mills all busy, with every prospect of a continuance of the same until the advent of the winter season. Prices on Boiler Tubes and Line-Pipe were advanced, the rest of the list remaining unchanged. Discounts on Black Butt-Welded Pipe, 52½ ¢; on Galvanized do., 45 ¢; on Black Lap-Welded, 65 ¢; on Galvanized do., 52½ ¢; Boiler Tubes, 1½ inches and smaller, 55 ¢; 2 inches and larger, 60 ¢; Casing, 5½ inches, 62½ ¢; other sizes, 60 ¢; 2-inch Tubing, 13¢ per foot, net; Line-Pipe, 2-inch, 10½¢ per foot, net; 2½-inch, 16¢; 3-inch, 21¢; 3½-inch, 25¢; 4-inch, 30¢; 4½-inch, 36¢; 5-inch, 42¢; 6-inch, 58¢; 7-inch, 70¢; 8-inch, 95¢; 9-inch, \$1.20; 10-inch, \$1.25; 12-inch, \$1.60.

Old Rails.—Continue in demand, with but few offering, but prices remain about as last quoted, \$22 @ \$22.50, cash; sale of 500 tons at \$22.50. A large consumer here says he can get all he wants at \$20 at Chicago, which with freight added, \$2.20, would make them cost \$22.20 here. Old Steel Rails are still quoted at \$16 @ \$17 for short lengths and \$19 @ \$20 for long lengths.

Steel Rails.—Are still quoted at \$26 @ \$27, cash, at mill, and as mills are all pretty well sold out the market is firmer.

Billets, Blooms, &c.—Sales of Bessemer-Steel Billets reported at \$26.75 @ \$27.25, according to size, quality and delivery. Sales of Bessemer Nail Slabs at \$26.50. No recent sales of Bloom Ends or Rail Crops reported, in the absence of which it is difficult to give reliable quotations.

Railway-Track Supplies.—Railway Spikes have been reduced to 1.95¢, 30 days, free on cars at works; Splice Bars unchanged at 1.60¢ @ 1.70¢, and Track Bolts at \$2.75 with Square and \$2.85 with Hexagon Nuts.

Old Material.—Is in rather better demand and firmer, but prices remain unchanged. No. 1 Wrought Scrap, \$18, net ton; Old Car Axles, \$23.50 @ \$24; No. 1 Wrought Turnings, \$13 @ \$14; Cast Scrap, \$13.50 @ \$14, gross; Old Car-Wheels, nominal at \$18.

Detroit.

WILLIAM F. JARVIS & Co., under date of June 17, 1889, report as follows: While for several weeks past we have been able to report a large number of inquiries, we have been unable to report any large sales. However, during the week just past several large orders for Lake Superior Charcoal have been placed, and also enough small sales of 50 to 200 tons to make a large quantity in the aggregate. The demand for Coke Irons has not been as great as for Lake Superior Charcoal, but a considerable number of small orders for Ohio and Southern Irons have been booked. While prices remain about the same, there are very few furnaces willing to make concessions to obtain orders, and some have decided to make no further sales for delivery after September, unless at higher quotations than at present are ruling. We report an active market and quoted as follows:

Lake Superior Charcoal, all numbers.....	\$19.00 @ \$19.50
Lake Superior Coke, all ore.....	18.00 @ 18.50
Lake Superior Coke, cinder mixed.....	17.50 @ 18.00
Standard Ohio Black Band.....	18.00 @ 18.50
Southern No. 1.....	16.50 @ 17.00
Southern Gray Forge.....	15.00 @ 15.50
Southern Silvery.....	16.00 @ 16.50
Jackson County (Ohio) Silvery.....	18.00 @ 18.50
Old Wheels.....	18.50 @ 19.00

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., {
ST. LOUIS, June 15, 1889. }

Pig Iron.—The improved condition of trade noted in last week's report continues. Prices show more strength, and there is a gradual movement toward somewhat higher figures, although as yet there is no quotable advance. Offers for good round lots at prices that would have been accepted two weeks ago are now refused, and in some instances slight advances have been asked, these, however, for brands of superior excellence. There have been a number of sales made during the past week, to be delivered as per ordered, which indicates a legitimate demand, and shows an absence of buying for speculative purposes. Standard brands are scarce and firm, and cannot be bought at the low prices at which some Irons were recently offered. For ordinary-sized lots we quote as follows, for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry,	\$15.25 @	\$15.75
Southern Coke, No. 2 Foundry,	14.75 @	15.25
Southern Coke, No. 3 Foundry,	14.25 @	14.50
Gray Forge.....	13.25 @	13.75
Ohio Softeners.....	17.00 @	19.00
Lake Superior Charcoal.....	19.75 @	21.50

Missouri.

Charcoal Foundry, No. 1.....	16.00 @ 16.50
Charcoal Foundry, No. 2.....	15.00 @ 15.50

Tennessee.

Charcoal Foundry, No. 1.....	17.00 @ 18 00
Charcoal Foundry, No. 2.....	16.50 @ 17 00
Connellsville Coke, f.o.b. East St. Louis, \$4.40; St. Louis, \$4.55.	

Bar Iron.—Trade shows signs of improvement daily, and mills are kept fairly well employed. Jobbers are heavy buyers, as are also the Car-works, and some little demand emanates from the railroads; this latter, however, is not as heavy as was anticipated, but taking everything into consideration, the outlook is more promising than for some months past. Small lots from store are quoted at \$1.80; carload lots from \$1.60 to \$1.70, according to circumstances.

Barb Wire.—Trade is dull and prices remain as last quoted. Mills have enjoyed a good trade since the first of the year, but now the farming industry has little or no time to give to fence building, hence the dullness. Mills quote from \$2.80 to \$2.85 for Painted and from \$3.40 to \$3.45 for Galvanized; carload lots at from \$2.70 to \$2.75 for Painted and \$3.30 to \$3.35 for Galvanized, f.o.b. St. Louis.

Louisville.

LOUISVILLE, KY., June 17, 1889.

Pig-Iron.—The market this week has shown increased stiffness, though some offerings have been made at very low prices. One or two of the prominent Southern furnaces have felt it wise not to offer their iron at present price and have withdrawn, and their views are about 50¢ a ton higher than Saturday. A few furnaces continue to sell at old prices, but we think the tendency of the market is upward and that prices will advance probably 50¢ @ 75¢ a ton. There has not been much Iron sold here during the past week, as buyers have not generally decided what action to take, but the disposition is to purchase for future delivery what Iron they desire during the year. Furnaces are meeting buyers' views to a certain extent where they are willing to pay 25¢ @ 50¢ over last week's prices. We quote as follows:

Southern Coke, No. 1 Foundry.	\$14.25 @ \$14.75
Southern Coke, No. 2 Foundry.	13.75 @ 14.25
Southern Coke, No. 3 Foundry.	13.00 @ 13.50
Gray Forge	12.50 @ 13.00
White and Mottled, different grades	12.00 @ 12.50
Silver Gray, different grades.	12.50 @ 13.50
Southern Charcoal, No. 1 Foundry	16.00 @ 16.50
" " No. 1 Mill.	14.50 @ 15.00
Southern Car-Wheel, standard brands.	21.75 @ 22.75
Southern Car-Wheel, other brands	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry.	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry.	19.50 @ 21.00
Hanging Rock, Cold Blast.	20.75 @ 22.75

Cleveland.

CLEVELAND, June 17, 1889.

Iron Ore.—The market retains its activity. Ores of all grades are selling freely at prices slightly below the quotations established at the beginning of the season. Good Gogebic Ores that then commanded \$5 are now to be had for \$4.75 and the very best Ores from this range are selling for \$5, instead of \$5.25. Menominee Bessemers are bringing \$4.50 at present and are in fair demand at that figure. Few non-Bessemer Ores from any of the ranges can now be purchased, nearly the entire output of the mines having been previously contracted for. For the scattering lots occasionally reported sold about \$3.60 per ton is paid. Despite the energetic efforts of the vessel men to increase Lake freights plenty of tonnage can still be secured at 90¢ from Escanaba, \$1.10 from Marquette and \$1.25 from Ashland. Indications are not wanting of an 80¢ rate from Escanaba before August. Ore is being pushed down from the Lake Superior district at a tremendous rate and the shipments are already nearly 1,000,000 tons ahead of those at a corresponding period last year. It is believed that 4,125,000 tons of Ore have already been sold.

Pig-Iron.—All the Iron now in stock could be easily disposed of at present prices. The demand is astonishing and the general tone of the market has considerably improved over last week. The advance in prices is, of course, purely speculative, but the extremely healthy condition of the Pig-Iron market seems to justify the belief that rock bottom has been reached and that future sales of Iron will be at prices slightly in advance of prevailing quotations. Nearly all the dealers in the city unite in the belief that better prices will come early in June.

Scrap-Iron.—Scattering sales of Old American Rails at \$21 are reported, but the market lacks activity. There is but small demand for Old Wheels, even at \$19. Old Axles are, however, selling freely.

Nails.—There is no material change in the situation. Steel Wire Nails at \$2.30 are in fair demand, and Steel Cut Nails at \$1.90 from store are selling with considerable freedom.

Cincinnati.

Office of The Iron Age, Fourth and Main Sts., CINCINNATI, June 17, 1889.

Pig-Iron.—The low prices current for Pig-Iron have not only attracted larger buyers for various deliveries, but inquiries have been numerous from consumers of all kinds of metal anxious to test the temper of the market rather than to make purchases. Speculators, too, have entered the market for no small amounts, but have failed to secure the full quantity desired at inside prices. With one or two exceptions, there is less pressure to sell at the close, Forge Iron, especially, being held more firmly. In some instances buyers have made direct purchases from furnaces, profiting by the omission of the commission. Although production continues on a liberal scale, the report of stocks at furnaces shows a steady decline, and the conviction that the market has reached its lowest level is strengthened. There has been more demand for Car-Wheel Iron, and 3000 tons Southern sold at \$23, for delivery during the next three or four months. Among the other larger sales were 900 tons No. 3 Southern Coke Foundry at \$13.25; 1000 tons do. No. 2 at \$13.75; 600 tons No. 1 at \$14.35; 1000 tons do. at \$14.75, cash basis; 2000 tons Gray Forge at \$12.75, and 1500 tons Mottled at \$11.75, cash. Sales of carload lots to 200 tons have been numerous at proportionate prices. There is more general activity than has been the case for several months. Business affairs aside from Pig-Iron are improving, and so far as these matters have a bearing the prospect is decidedly improved, but a more active money market may modify the tendency toward better prices. The following are the approximate prices current here at the close for cash, f.o.b.:

Foundry.	
Southern Coke, No. 1	\$14.25 @ \$14.75
Southern Coke, No. 2	13.75 @ 14.25
Southern Coke, No. 3	13.25 @ 13.75
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 15.25
Mahoning and Shenango Valley	16.00 @ 16.50
Hanging Rock Charcoal, No. 1	20.00 @ 22.00
Hanging Rock Charcoal, No. 2	19.00 @ 21.00
Tennessee and Alabama Charcoal, No. 1	17.50 @ 18.00
Tennessee and Alabama Charcoal, No. 2	16.50 @ 17.00
Forge.	
Strong Neutral Coke	12.75 @ 13.00
Mottled Neutral Coke	11.75 @ 12.00
Gray Forge	12.75 @ 13.00
Car-Wheel and Malleable Irons.	
Southern Car-Wheel	20.00 @ 23.00
Hanging Rock, Cold Blast	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable	20.00 @ 21.00

Manufactured Iron.—There has been some little increase in the orders placed, and mills and foundries are fairly busy on old contracts, but while there is a better feeling, there is no tendency toward higher prices.

Nails.—There has been a fair jobbing demand, but an easy tone has prevailed, without essential change in prices. Steel Nails, 12d and 40d, sell at \$1.80 @ \$1.90 per keg, with 10¢ rebate in carload lots at the mills, and Steel Wire Nails at \$2.40 @ \$2.50 per keg.

Old Material.—The demand for Rails has continued moderate, but the offerings have not been large and the market is fairly quotable at \$20, spot. There has been some inquiry for Old Wheels at \$16, cash, but offerings have been small.

New York.

Office of The Iron Age, 66 and 68 Duane street, NEW YORK, June 19, 1889.

Pig-Iron.—Very decided activity has prevailed among those who are in a position to furnish Iron promptly. Sales are reported of numerous lots ranging from 50 tons to 2000 tons. A number of dealers have disposed of 1500 to 2000 tons each

during the past week, and one house reports transactions aggregating 6000 tons. The heavy purchases of material of all kinds by the railroads have undoubtedly stimulated the Pig-Iron market, and it is hoped that the impetus thus given may not be merely temporary. The buying movement now in progress has clearly demonstrated that both consumers and furnace companies were carrying light stocks. Some of the furnace companies have notified their agents to take no more orders at present, as their capacity is well covered for several months. Outstanding options have been withdrawn, and manufacturers are evidently getting themselves in readiness to take advantage of an upward movement in prices if the demand continues. Some dealers, however, take a conservative view of the situation, believing that consumers have pretty well covered their requirements for the time being and that there will not be sufficient activity to cause much of an advance. Here and there prices on various brands have been marked up 25¢ @ 50¢ per ton, but the general range continues about as previously quoted, namely: Northern Irons at tidewater, \$16.50 @ \$18 for No. 1, according to brand; \$15.50 @ \$17 for No. 2; \$14.50 @ \$15.25 for Gray Forge. Southern brands sell at \$16.25 @ \$17 for No. 1; \$15.50 @ \$16 for No. 2; \$14.75 @ \$15 for No. 3; \$4.25 @ \$14.50 for Gray Forge, all delivered at New York.

Scotch Pig.—Larger transactions are reported, with orders entered for future delivery, which is a feature of trade that has been wanting for some time. Quotations are as follows: Eglington, \$19 @ \$19.50; Dalmellington, \$19.50 @ \$20; Summerlee, \$21.50; Langloan, \$21; Coltness, \$21.50 @ \$21.75.

Spiegeleisen.—Several thousand tons of 20 % were sold at about \$28. Small transactions in Ferro are reported at \$58 @ \$60 for 80 %.

Wire-Rods.—Quotations are nominal at \$43, ex-ship. No transactions are possible at this price.

Structural Iron and Steel.—The market is very active and strong. Quotations for delivery on dock are as follows: Sheared Plates, 2.05¢ @ 2.1¢; Universal Mill Plates, 2.1¢ @ 2.15¢; Angles, 2.05¢ @ 2.1¢; Tees, 2.5¢ @ 2.6¢; Beams and Channels, 2.8¢.

Plates.—An excellent business is reported, with an upward tendency in prices still existing. Quotations are as follows for delivery on dock: Tank Iron, 2.05¢ @ 2.1¢; Shell, 2.4¢ @ 2.5¢; Steel Tank, 2.25¢ @ 2.3¢; Shell, 2.4¢ @ 2.5¢; Flange, 2.7¢ @ 2.8¢; Fire-box, 3.25¢ @ 4¢.

Bar-Iron.—The demand is not so heavy as for other classes of material, yet some good orders have been entered. Quotations for dock deliveries are as follows: Common, 1.6¢ @ 1.65¢; Medium, 1.7¢; Refined, 1.75¢ @ 1.9¢. Some mills are refusing to sell at less than 2¢.

Merchant Steel.—Business has been rather quiet, but orders are being received for shipment after the 1st of July, so as to throw them into the new fiscal year of manufacturing consumers. Some complaint is heard of slow collections. Tool Steel, good brands, in large lots, is still quoted at 7¢ @ 7½¢; specials, 12½¢ @ 20¢; Crucible Spring, 3½¢ @ 4¢; good Open-Hearth Machinery, 2.30¢ @ 2.5¢; common ditto, 2¢ @ 2.25¢; Open-Hearth Spring, 2½¢ @ 2.5¢; Sheet, 6½¢, 8½¢ and 10½¢.

Steel Rails.—The mills are now so well supplied with work that railroad companies are finding some difficulty in arranging for early deliveries. The sales of the week have been confined to small lots, the largest reported consisting of 3000 tons. A good movement in light-weight Rails is

in progress. They are being placed on the basis of \$28 at mill for heavy sections, which is the rate now quoted on small orders. Quotations on large contracts are firm at \$27.50 at mill. Speculative lots, taken some time since, are being pressed on the market, but the holders of such contracts are finding it very difficult to dispose of them for some reason.

Track Supplies.—A much better feeling obtains among sellers. A heavy volume of business is reported, with quite a number of negotiations pending. Some mills are now filled up on Fish-Plates to August, and prices are naturally firmer with their withdrawal from the market for the time being. Quotations for Fish-Plates of Iron or Steel range from 1.80¢ to 1.90¢; Track Bolts, Square Nuts, 2.70¢ @ 2.75¢; Hexagon Nuts, 2.90¢, Common Iron, and 3¢, Refined; Spikes, 1.95¢ @ 2¢.

Old Material.—Old Iron Rails are in good demand, while the supply is very limited. About 2000 tons were secured by a prominent consumer, who claims to have paid only \$22, but other parties bid the same figures and were unable to consummate a purchase, so that this price hardly represents the market at present. Holders are decidedly firm in their views and are looking for considerably higher prices. Inquiries are being received for Old Steel Rails, but no sales are reported. Buyers offer \$17.50. No. 1 Wrought Scrap has been sold along railroad line at \$20 in quite considerable quantities. Among city yards there is less inquiry for No. 1 and little business is being transacted. Buyers offer \$19.50 @ \$20, delivery on cars, and have declined an offer of \$20 to boat. Cast Scrap is dull at \$14.50 @ \$15, while Turnings and Cast Borings are unchanged.

Financial.

There are some favorable features in the commercial situation, but there is little buoyancy outside of a few special lines. In New York the aggregate of transactions as per clearing-house returns, shows an increase for the week of 20.5 % compared with the same time last year, largely due to speculative activity, not only on the Stock Exchange, but in wheat, coffee and some other commodities, sales of coffee on a single day reaching the colossal aggregate of 124,000 bags under the stimulus of a heavy decline, equal to 2¢ $\frac{3}{4}$ within the last two days. The depression and the excitement incident to it were attributed to a sharp decline of 3½ francs in coffee at Havre, which was influenced by the increased crop estimates for Brazil and the unwillingness of big holders here to carry their load. Wheat dealers, too, were full of business, with prices varying widely. On Monday there was a sharp advance, succeeded by a heavy break, with enormous trading, the largest since last autumn, comprising 24,600,000 bushels. Among dry goods jobbers the only feature of the week is in the return of money buyers from Europe, who report business in all manufacturing centers good, and all seemingly independent of the American market, with higher prices all along the line. The character of the fall trade is not yet determined. Exports of manufactured cottons since January 1 are less than \$4,000,000 in value, against upward of \$5,600,000 for the same time last year. Provisions are easier. Sugar is strong. In the dairy line there are enormous receipts, favored by an exceptionally fine grass season. Crop prospects as a whole are not perceptibly affected by bad weather, and collections are fair.

In the Stock Exchange markets the freight rate troubles in the West, more particularly news that the Chicago and Alton had given notice of an intention to with-

draw from the Interstate Railway Association July 15, were a fruitful source of disturbance. Nevertheless, several of the leading specialties were higher. New England was influenced favorably by prospects of the near completion of the Peekskill bridge, as it is believed that considerable shipments of coal will take the new route, via Lehigh & Hudson to Eastern points. On Friday stocks were dull and lower, the sharpest declines occurring in St. Paul and Burlington and Quincy. New England was again the feature, and closed weak. Saturday brought a dull market, with the coalers firmest on the list, on account of the supposed better prices for anthracite. On Monday the market varied with conflicting reports from the West, but Lead Trust and Sugar Trust attracted much attention, and there was a stronger tone at the close.

On Tuesday there was a little more hopeful feeling at Chicago, it being believed that the Chicago and Alton Railroad cannot substantiate their charges against the St. Paul, and that they will before July 15 take back their notice of withdrawal. The tone of the market was firm to strong. At the annual election of the Oregon Transcontinental and of the Oregon Railway and Navigation companies Mr. Villard carried the Oregon Transcontinental, and a compromise was effected whereby the Oregon Railway and Navigation Company will be managed as part of the Union Pacific system, the Northern Pacific to have nothing to do with it. The new board decided to abandon the proposition to issue \$10,000,000 of preferred stock.

United States bonds were firm. Quotations as follows:

U. S. 4½s, 1891, registered.....	100%
U. S. 4½s, 1891, coupon.....	100%
U. S. 4s, 1907, registered.....	128½
U. S. 4s, 1907, coupon.....	129½
U. S. currency 6s.....	118

The weekly statement of the Associated Banks was unexpectedly favorable in showing a decrease in surplus reserves of only \$42,950, due entirely to an increase of \$2,339,800 in net deposits. In loans there was an expansion of \$2,384,400, which was thought to have resulted from the increased activity at the Stock Exchange. The changes indicate receipts of about \$5,000,000 from the interior. In other words, the movement of currency to this center exceeded the outward flow of gold to Europe. The banks still hold \$10,603,225 above legal requirements, against \$28,563,700 a year ago and only \$4,616,625 in the same week of 1887. According to the Custom-House report, the exports of specie from this port during the week amounted to \$4,675,493, making a total since January 1 of \$41,784,818, as compared with \$19,790,000 for the corresponding period last year, and larger than for the same time for any year in the last decade. Imports of specie since January 1 are about \$4,000,000. On Saturday \$4,004,857 was shipped, chiefly to Paris, there being a profit in such transactions owing to the firm tone for Continental exchange. Notwithstanding the heavy gold exports, the monetary situation continued easy and rates were 3 @ 4 % for time loans and 4 @ 5½ % for prime mercantile paper, but the general tone was firmer.

As the season is at hand for the usual semi-annual interest and dividend disbursements, amounting to at least \$65,000,000, the continuance of easy money is looked for with confidence.

The market for sterling was quiet, with posted rates closing at \$4.88 @ \$4.89½. Gold continues to flow into the Bank of England, and the situation, so far as bullion is concerned, promises easy money. A further drain to South America is not improbable.

A phase in Canadian banking that is likely to attract more attention hereafter, namely, the smallness of the cash reserves in proportion to the liabilities, brings out

a cautionary signal in the *Montreal Gazette*, as follows: "The Dominion Government debt payable in London has increased since 1883 from \$130,000,000 to \$196,000,000, or by no less than \$66,000,000, every dollar of which increase was available ultimately through the Canadian banks for the liquidation of mercantile indebtedness in Great Britain, for sinking fund purchases and for the payment of interest on the debt. The annual interest the Dominion has to pay on its debt held in London is now nearly \$2,000,000 more than it was in 1883. It is well known that in imports and exports of merchandise the balance of trade runs against Canada, though not to a large extent, but when to this trade-balance is added the interest upon Government, municipal, railway and other indebtedness, the sum becomes a very formidable one, and only fresh borrowing from time to time has averted a crisis which would expose how much dependency we have upon new drafts of capital for the settlement of foreign indebtedness."

The imports of merchandise at this port during the week were \$8,012,000. Since January 1 the total valuation is \$233,050,000, against \$222,909,000 for the same time in 1888. Exports from this port for the week were valued at \$6,556,000.

Exports of breadstuffs, provisions, cotton and petroleum during May were in value \$32,239,869, against \$28,643,471 in May, 1888. For 11 months ending May 31 the exports of the above-mentioned articles were \$478,703,315, against \$454,543,884. This is a large increase, but the imports have increased to a greater amount. The exports of oils for 11 months of the present fiscal year, as shown by the Treasury report, foot up 554,873,474 gallons, at a value of \$45,158,554, against 530,407,778 gallons, valued at \$42,849,967, for the corresponding period of the year preceding.

A new bank, to be called the Knickerbocker, is soon to be opened on Broadway, near Twenty-eighth street.

Metal Market.

Copper.—At the time of our last report spot Copper stood in London £41. 7/6; it came last night £41. 5/, while futures gave way from £41. 5/ to £41. The statistics of the middle of the month show the visible supply in England and France to have been at the time 114,320 tons, the decrease being 3000 tons for the fortnight, and chiefly in Chili Bars, indicating that consumers over there extend their purchases for the moment to the lower grades. The total sales for the week over there were only 800 tons, however. Here the situation and prices have undergone no change; the mining companies declare themselves satisfied with the deliveries going on to actual consumers, while these insist they are only buying from hand to mouth. There is no change in the quotations, 12¢ being the rule from the producers of Lake direct; in a jobbing way the figure is 12½¢ @ 12¾¢, and casting brands fetch 11¢ @ 11¼¢. On the exchange to-day there were no bids; 12¢ was asked.

Tin.—On Wednesday of last week London still quoted £90. 17/6 for spot, which dropped to £89. 15/ yesterday. Futures in the meantime declined from £91. 12/6 to £90. 16/. The fact is that the late relatively-high ruling caused a larger output in the producing countries, and the London operators now let the market slide in order to put, if possible, a slight check on the manifest tendency toward overproduction. They may keep prices low for a couple of months, and if then the output relaxes the screws may be put on again. At least this is given out as the programme for the time being. The week's sales in London aggregated 600 tons. Here some

110 tons were first sold on the exchange at 20.20¢, spot and June, and at 20.25¢, September and October; subsequently trading was arrested, the bids not exceeding 20.25¢ for near and 20.15¢ for distant deliveries, the quotation for spot this forenoon being 20½¢ @ 20¼¢. Messrs. Gilfillan, Wood & Co., Singapore, write under date May 9: "Stocks are not large, nor are large supplies expected to arrive in the near future, so that any further decline there may be must take its origin in the consuming markets." Tin closed on the exchange at 19.95¢ bid, and 20.05¢ asked. **Tin Plates.**—Our dealers, who have been holding back their "future" orders are, now that Pig Tin is lower, in hopes of gaining their point, and buying 3d box cheaper than what makers on the other side demand. Meanwhile our market has been dull and unchanged. We quote large lines, ordinary brands, 3 box: Siemens-Martin Steel, Charcoal finish, \$4.75 @ \$5.50; Coke finish, \$4.55 @ \$4.65; Terns, \$4.12 @ \$4.30; Coke Tins, \$4.22½ @ \$4.32½, and Wasters \$4.12½ @ \$4.15.

Lead.—The week has been an excessively dull one, sales in the open market to consumers being restricted to 400 tons at 3.95¢ @ 4¢, the market winding up quite firmly at 3.97½¢ @ 4¢, while St. Louis is strong at 3.80¢ @ 3.85¢ and Chicago at 3.90¢. Closing prices on the exchange to-day were 3.97½¢ bid and 4.02½¢ asked.

Spelter.—There has been a lull, so that we cannot quote Common Domestic on the spot over 5¢, nor Silesian any better than 5½¢. There are no new features, the demand being slack for the moment, but the position of the metal is apparently quite sound.

Antimony.—We repeat our quotation of 14¢ for Hallett's and 15¼¢ Cookson's, at which there continues to be a steady, moderate consumptive demand.

New York Metal Exchange.

The following sales are reported:

THURSDAY, June 13.	
10 tons Tin, spot	20.20¢
20 tons Tin, June	20.20¢
80 tons Lead, August	3.97½¢
FRIDAY, June 14.	
20 tons Tin, October	20.25¢
10 tons Tin, September	20.25¢
10 tons Tin, spot	20.20¢
10 tons Tin, June	20.20¢
50 tons Lead, spot	3.95¢
WEDNESDAY, June 19.	
16 tons Lead, spot	3.97½¢

Coal Market.

The Anthracite Coal trade is gradually recovering from the effects of the great flood. All but eight of the drowned Reading collieries are again in operation, but the Beech Creek line is not yet restored and several of the laterals of the main lines of railway to the sources of supply are still closed to shipments. The New York market suffers from dullness in the bulk of demand rather than from any shortness of supply, stocks at shipping ports being ample, despite the temporary enforced check in production. Operators profess to believe in renewed activity early in July, and remarks are freely made about another advance in prices, but it is said that the large consumers are not uneasy concerning the prospects. Touching on this subject the Philadelphia Record says that Coal can be bought in that city at concessions from the March circular, and it can be said on authority that the Reading Company have not received one order for Coal this month at the advance made last month. In the Pottsville region at last accounts there was no increase of business and much of the Coal was going into stock. Quotations remain unchanged, viz.: Free Burning,

f.o.b., Broken, \$3.85; Egg Chestnut, \$4; Stove, \$4.30. Reading last week reported 140,000 tons production, of which 30,000 was shipped to Port Richmond and 20,000 to Port Liberty. The Pennsylvania Railroad's Coal tonnage for the year is 4,439,000 tons, a decrease of 691,000 tons compared with 1888.

Bituminous Coal shipments are reported to be more active and the placing of several good mill contracts is referred to. Coal shipments from the Clearfield region were resumed last Sunday, and the daily shipments are from 200 to 300 cars. The Reading Railroad have finished the survey of a branch road from Lofty to Drifton, following the Lehigh Valley most of the way. This road is to carry the Coal from Coxie Bros. & Co.'s collieries at Drifton. Another movement is the organization of the Pennsylvania, Lehigh and Eastern Railroad at Wilkesbarre, with Samuel F. Pierson as president, to run a line from Tomhicken, Pa., to Port Jervis, N. Y., offering a short outlet for hard coal to New England via the Poughkeepsie bridge. The route, as surveyed, will go in close proximity to nearly 50 collieries and through the cream of the Anthracite Coal regions in Luzerne, Carbon, Monroe and Pike counties.

Imports.

Hardware, Machinery, &c.

Boker, Hermann & Co., Arms., cs., 55; Mds., cs., 4
Downing, R. F. & Co., Mach'y, pgs., 15
Frasse, P. A., Mds., cs., 3
Foley, Edw., Mach'y, cs., 3
Folsom, H. & D., Arms Co., Arms, cs., 11
Hartley & Graham Arms Co., Arms, cs., 22
Lau, J. H. & Co., Arms, cs., 9
Merch. Desp. Co., Arms, cs., 12
Page, Dennis & Co., Mach'y, cs., 1
Quin, Hugh, Mach'y, cs., 1
Schoverling, Daly & Gates, Arms, cs., 41
Seegar & Guernsey Co., Mach'y, pgs., 41
Singer Mach. Co., Mach'y, cs., 14
Trovers Bros., Mach'y, pgs., 11
Westermann, H., Arms, cs., 16
Wiebusch & Hilger, Lim., Arms, cs., 23; Hdw., pgs., 12
Witte, John G. & Bro., Cutlery, cs., 4
Order: Mach'y, cs., 69; Cylinders, 3; Castings, 16

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, June 19, 1889.

Copper has ruled very irregular, having dropped 20/ and recovered 10/ during the week. Rumors of continued negotiations between the mining officials serve a purpose in supporting the market. The offerings of Merchant-Bar warrants have been larger the past week, and consumers are freely supplied. Dealers have appeared little disposed to purchase. Transactions in furnace material have been on a quite extensive scale, and at somewhat better prices. James Lewis & Sons' record for the first half of the month includes 900 tons Anaconda matte at 8/6, 100 tons Montana at 8/6, 700 tons Montana at 8/3 and 470 tons Montana, private terms, all to arrive, Liverpool delivery. The visible supply of Copper has decreased the past fortnight 4500 tons, and the new supply was 4100 tons less than during the preceding two weeks.

Block Tin receded in price to £89. 15/ on Tuesday under the pressure of heavy selling movement, due to expected large shipments from the Straits. The immediate future of the market depends chiefly upon the extent of those shipments. The current consumption absorbs fully the late average of the supply. To-day prices were very irregular, with sales of prompts at £89. 10/ and £90.

There was a lull in the Tin-Plate market early in the week, but the demand since became quite active and good sales were made of specials. Terns have been selling quite freely on the basis of 24/ for double boxes. Inquiries are favorable for a continued good business.

Scotch warrants weakened on Wednesday and Thursday last, owing to a pause in the demand that frightened weak holders and encouraged "bear" selling. Since then there has been a recovery, but only a moderate business. Reports from the makers indicate a healthy trade in named brands, but prices are hardly steady. Middlesborough Pig is offered a fraction lower by makers, whose prices are still undersold by merchants. Hematites have ruled very steady, but Spiegeleisen is rather easier.

Common Staffordshire and Welsh Bars are held higher, being in very good demand, but there is no change on other Manufactured Iron. In the Steel trade there is some irregularity, with higher prices asked for Billets, Slabs and Wire-Rods, but some concession made on Steel Rails. A Chilean order for 10,000 tons of Rails, on which British makers competed, was secured by a German firm.

A further improvement in the demand for Old Material and increased purchases of the same are reported.

Scotch Pig.—There has been only a fair business and prices show little change. Ocean freights from Glasgow to New York are a shade higher.

No. 1 Coltness, f.o.b. Glasgow	54/6
No. 1 Summerlee, " "	54/
No. 1 Gartsherrie, " "	51/6
No. 1 Langloan, " "	51/
No. 1 Carnbroe, " "	46/6
No. 1 Shotts, " at Leith	52/
No. 1 Glengarnock, " Ardrossan	51/6
No. 1 Dalmeilington, " "	45/
No. 1 Eglinton, " "	43/6
Steamer freights, Glasgow to New York, 2/6; Liverpool to New York, 10/.	

Cleveland Pig.—Business has been moderate and prices are rather weaker. No. 3 Middlesborough quoted 38/ @ 38/6, prompt.

Bessemer Pig.—A fairly active business reported at steady prices. West Coast brands, mixed numbers, 49/6, f.o.b. shipping point.

Spiegeleisen.—A moderately active trade at somewhat modified prices. English 20 % quoted 80/, f.o.b. at N. W. England shipping point.

Steel Rails.—There has been a very good business, but prices are not so strong. Heavy sections quoted at £4. 10/, and light sections £4. 17/6 @ £5. f.o.b. at N. W. England shipping point.

Steel Blooms.—A fair demand and the market steady. We quote £4. 5/ for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Makers ask higher prices and there is a fair business. Bessemer, 2½ x 2½ inch, £4. 12/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—Not much doing, but makers very firm on prices. Bessemer, £4. 12/6, f.o.b. at N. W. England shipping point.

Old Rails.—More business doing and the market firmer, without, however, any positive advance. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads, £3. 12/6 @ £3. 15/, c.i.f., New York.

Scrap-Iron.—The market quite firm, and more active. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

Crop Ends.—There is more doing, at firm prices. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

Tin-Plate.—A fairly active business, with little change in prices. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade.....	15/3 @ 15/4
IC Bessemer Steel, Coke finish.....	13/6 @
IC Siemens.....	13/6 @
IC Coke, B. V. grade.....	13/ @
Charcoal Terne, Dean grade.....	12/ @ 12/3

Manufactured Iron.—The general demand good, and prices firm. We quote, f. o. b. Liverpool:

Staff. Marked Bars.....	£ s. d. £ s. d.
" Common.....	@ 8 2 6
Staff. Bk Sheet, singles.....	7 12 6 @ 7 15 0
Welsh Bars (f.o.b. Wales).....	5 7 6 @ 5 10 0

Copper.—The market has been unsettled, but more active than last week. Today's prices for Bars were £41. 10/; spot; £41 three months' futures. Best Selected, £47.

Tin.—Trading has been smaller than last week and the market unsettled. Straits quoted to-day at £89. /10 @ £90, spot, and £90. 2/6 @ £90. /5 for three months' futures.

Lead.—The market very quiet but steady. Quoted £12. 10/ for Soft Spanish.

Spelter.—A moderate business at unchanged prices. Quoted at £18 for ordinary Silesian.

Foreign Markets.

EQUIVALENTS.

Franc, Peseta or Lira.....	Cents.
Florin (Netherlands).....	19.3
Florin (Austria).....	40.2
Florin (Portugal).....	35.9
Milreis (Brazil).....	41.08
Mark (Germany).....	23.8
Kilogram.....	Pounds
Picul.....	2.205
	134.

EAST INDIES.

MANILA, June 10, 1889.—Hemp.—The price is nominal at \$15.75 p picul, against \$8 same date last year, equaling p ton, cost and freight, £50, against £27. 7/6. Clearances for the United States since last cable amounted to 9000 Bales, against 7000 in 1888. Since January 1 to 118,000, against 88,000; loading for ditto, 13,000, against 11,000; cleared for England since January 1, 120,000, against 148,000; loading for ditto, 8000, against 31,000; cleared for other countries, 19,000, against 38,000; receipts at all ports since last cable, 900, against 15,000, and since January 1, 267,000 bales, against 253,000 in 1888 and 212,000 in 1887. Freight—\$7.50, against \$5.50. Exchange.—Six months' sight, on London, 3/5, against 3/5 1/4. Ker & Co., per cable direct to their agent in New York, Mr. Charles Nordhaus, 89 Water street.

COLOMBO, Ceylon, May 2, 1889.—Plumbago.—The market has remained firm at ensuing quotations, in rupees, p ton: Large Lumps, 145 @ 170; Ordinary Lumps, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 65. Following are the shipments made since October 1: To England, 94,157 cwt.; to Hamburg, 6206; to Antwerp, 6007; to Bremen, 659; to Holland, 487; to India, 96; to Australia, 203, and to the United States, 85,951; together, 163,806 cwt., against 148,830 in 1888, 125,123 in 1887 and 110,074 in 1886. Coir Yarn.—Nos. 1 @ 4 has been selling at 7 @ 13 rupees p cwt. Exchange.—Six months' sight, 1/4 1/4. Volkart Bros., Ceylon and Malabar Coast, to their agent in New York, Mr. John W. Greene 82 Wall street.

PENANG, April 30, 1889. Tin.—Of the fortnight's receipts of 7500 piculs Europeans took 2100 and Chinese 4000. Opening at \$35.60 p picul, the price gave way to \$34.60, at which it closes. The stock demand has caused the stock in bazar to reach 5500 piculs.—Schmidt, Kuster-mann & Co.

SINGAPORE, April 30, 1889. Tin.—Some 165 tons have been sold from \$35.75 p picul down to \$35.15 the market closing weak at \$34.60 @ \$34.55. The export hence to England since January 1 amounts to 67,657 piculs to the United States to 37,202, and 10,129 to the Continent. Gum Damar.—A sale of 50 piculs Palembang was made at \$17.50. Gum Copal.—Some 100 to 120 piculs were taken at \$7 @ \$10.75, as to quality. There has been more doing in Gum Benjamin, 60 cases fair Padang bringing \$48 @ \$54.50. Gutta Percha.—There is no change, but the better sorts are in less request at \$130 @ \$155, while medium fetches \$85 @ \$130. India Rubber.—Has been selling at \$45, and Borneo at \$45.50 @ \$46. Exchange in London, four months' Bank, 3/0 1/4 @ 3/1.—Giffman, Wood & Co.

HOLLAND.

ROTTERDAM, June 6, 1889. Tin.—The production of Billiton for 1888-89—from May 1, 1888, to April 30, 1889—amounts to 79,194 piculs, against

77,840 in 1887-88, 59,192 in 1886-87, 81,052 in 1885-86, 61,337 in 1884-85, 70,974 in 1883-84, 70,081 in 1882-83. The average production during the last ten years is about 76,000 piculs. A public sale of about 12,000 piculs will be held at Batavia on June 27 next. The following statement shows the position of Banca Tin in Holland on May 31, from the official returns published by the Dutch Trading Company:

Import in May, slabs.....	1889. 1888.
Total, five months, slabs.....	22,287 17,797
Deliveries in May, slabs.....	83,200 109,933
Total, five months, slabs.....	9,900 13,148
Stock, second hand, slabs.....	61,088 39,748
Unsold stock, slabs.....	38,051 50,809
	149,382 107,233

Total stock, slabs.....	187,433 158,048
Afloat, piculs.....	3,200

Statement of Billiton.

Import in May, slabs.....	1889. 1888.
Total, five months, slabs.....	8,600 8,000
Deliveries in May, slabs.....	38,276 46,076
Total, five months, slabs.....	8,700 12,670
Stock, slabs.....	34,328 28,841
Afloat, piculs.....	23,248 32,363
	19,000 16,500

Quotations, May 31, Banca.....	55 1/4 f. 51 1/4 f.
Quotations, May 31, Billiton.....	55 1/4 f. 51 f.

Export of Tin from Holland.

	Three months.
	1889. 1888. 1887.
Tons. Tons. Tons.	
To Germany.....	1,472 1,033 1,516
To England.....	56 28 31
To Belgium.....	232 50 277
To France.....	44 20 96
To Hamburg.....	162 56 174
To the United States.....	128 95 105
To other countries.....	45 12 300
Totals.....	2,129 1,394 2,399

—De Monchy & Havelaar.

GERMANY.

HAMBURG, June 8, 1889.—Iron.—Matters in the iron trade have not yet returned to their normal condition. The demand for Pig has increased somewhat; most of the blast-furnaces have, it is true, resumed work, but some only work with half their force. Luxembourg may be quoted 36 @ 38 marks p ton; Westphalian, 40 @ 42 for finished iron. A good demand still prevails for Hoops, Beams and Boiler-Plates. Thin Sheets sell swimmingly at the advance established of 15 marks p ton. Machine-shops, foundries and car-shops have been getting on steadily. Wire-Rods are unaltered; they quote them 110 @ 120, and Steel-Rails 120 @ 125. Metals.—Have on the whole been well sustained; Lead at 13 @ 13.30 marks p 50 kg.; Spelter at 18 @ 18.50.—Borsenhalles.

BELGIUM.

BRUSSELS, June 8, 1889.—Iron.—Our market has remained very active and firm, with an upward tendency in Merchant Iron, for which there is an increased demand, also for Beams. There is a good run of orders for Structural Iron; only foundries working for the export trade complain of a lack of work. Following are the closing quotations: Pig, Foundry, 5.20 @ 6.50 francs p 100 kg.; Forge, 4.80 @ 5.60; Merchant, No. 1, 12 @ 12.50; Beams, 11.75 @ 12; Sheet Iron, 16 @ 25; Steel, ditto, 18.50 @ 19.50.—Moniteur des Intérêts Matériels.

Samuel Untermyer, the agent for the English syndicate which is purchasing American breweries, said to a reporter in this city on Tuesday: "This syndicate, which, by the way, is not a syndicate, but merely a number of English capitalists, is going to invest in flour-mills and rolling-mills. We are already negotiating for the purchase of different mills, and propose to manufacture steel rails in this country. I am not at liberty now, however, to state where these manufactories and mills are."

The latest estimate of the railroad mileage of the world is given in a German periodical. The conclusion is that there are 324,400 miles of railroad in existence, in which \$26,500,000,000 is invested. The capital in Europe is \$113,000 per mile and in other countries \$59,000. Nearly one-fourth of the mileage of the railroads of the world has been constructed during the last four years. This country leads all others in the amount of mileage, which is placed at 150,700, a low estimate. Of the European countries Germany leads with 24,900 miles and France, England, Austria and Russia come next in the order named, the latter reporting 18,000 miles. In British India there are 14,200 miles of road; in Cape Colony, 1700 miles; in Brazil, 5000 miles; in the Argentine Republic, 4000 miles; and in all the Australian provinces 9500 miles. Railroad-building is going on very fast in South and Central America, Australia, Japan and in Natal and Mauritius in Africa.

Bituminous Coal Production.

The Seaboard Steam Coal Association of bituminous coal producers, organized to maintain pool prices, has met with but indifferent success from its inability to enforce its own rules and regulations. At scarcely any time have the prices officially announced more than approximated the prices actually ruling. The Philadelphia Record predicts that this year will witness the disruption of the whole concern. "There is no longer any doubt of that among soft-coal shippers by reason of its utter worthlessness and weakness. At the beginning of this year iron-bound articles were signed, to which all the larger operators were induced to subscribe. The prices were fixed for coal shipped to the East from each of the Atlantic ports, and stringent regulations provided for a deposit by each shipper for every ton shipped as a guarantee that he would live up to the terms of the agreement. There is not one of the provisions but has been utterly disregarded. Prices have been slashed by the larger operators, and the smaller men have followed as best they could. The deposit of 20 cents on each ton mined has proved a manifest absurdity, as was prophesied at the start, and the Steam Coal Association has no excuse for existence." The reasons given for this situation are that "there is too much soft coal seeking a market to make any agreement for restriction possible. There is hardly one of the bituminous districts but can largely increase its output if occasion demands or if the smallest profit can be derived. At the Western part of the Clearfield region there are new developments of considerable size, but in the Southern regions almost an indefinite amount of coal can be mined. In the Pocahontas region of Virginia and West Virginia and in the Elk Garden region of West Virginia there are immense deposits of coal not yet touched. With conditions such as these, with an innumerable number of competitors trying to increase their tonnage, the effort at restriction is absurd and has signally failed."

A Simple Boring Test.—The question of simple methods of investigating the ground underlying foundations has been lately discussed in *Engineering News*. The latest method suggested for borings of moderate depths comes from a correspondent signing himself "Buckeye." He says he has frequently used for this purpose the following simple method: Take a worn-out locomotive boiler flue, and cut slots about 1/2 x 6 inches in a spiral winding around the flue. Then sharpen one end of the flue to a cutting-edge and put a heavy screw-cap on the other end. This cap should be not less than 3 inches long and solid for 2 inches of its length. In using this testing apparatus drive the flue down with a heavy sledge and at the same time turn the pipe with a large chain-tongs. The pipe can be lifted again by a lever or a derrick of portable form. When the tube is withdrawn the character of the material penetrated can be examined through the slots in the sides. A locomotive boiler-flue is generally about 11 feet long, but this is usually sufficient to test the foundations of small bridges and other light structures.

A fleet of small twin-screw boats, propelled by electricity, will run on the Thames River, England, this summer. They will transport passengers from place to place over short distances. The electricity is to be generated from accumulators carried on the boats and recharged when necessary at any of the river stations. The boats are 65 feet long, 22-inch draft and carry 80 passengers.

Hardware.

While in some respects the business of the half-year now closing has not come up to expectations, a review of the trade shows that on the whole it has been reasonably satisfactory. Many manufacturers have been fully occupied on orders, and the volume of business has been large. The margins of profit have in many lines been narrow, and there has been some disposition on the part of some to sell goods at a positive loss. There are, however, indications that manufacturers are recognizing the necessity of refusing unremunerative business, and if this were generally done it would greatly improve the situation.

Cut Nails.

The sales of the past week have been quite large in the aggregate, much of the business having been unsolicited. Inquiries are evidently being stimulated by the disposition of dealers to advance prices. The market is in quite a feverish and unsettled condition. Some of the leading houses have already pushed their quotations up a notch or two, and the others are selling very cautiously, with a watchful eye on their stocks. Shipments of Nails from the factories in the recently flooded districts of Pennsylvania are still being interfered with, so that it is difficult to arrange definitely for the future. Dealers are quoting on inquiries for immediate acceptance only. The Oxford Iron and Nail Company's price is now \$2, but the other houses are still naming \$1.80 @ \$1.90, with sales at about \$1.85 on an average. Cheap stocks seem to have been pretty well cleaned up by this time, and the market is in much better shape for an advance than for a long while.

The regular monthly meeting of the Western Cut Nail Manufacturers' Association was held in Wheeling, W. Va., on Wednesday, the 12th inst. No agreement whatever was reached looking either to a curtailment of production or a change in selling price. The Jefferson Iron Works, of Steubenville, Ohio, gave notice of their withdrawal from the organization. An effort was made to reduce the so-called extras on the list and reduce them all along the line, with a view of checking the demoralization caused by what are known as the "averages," which are calculated by each mill for itself. Pending a discussion on the subject a motion to adjourn was carried. The impression prevails that the association has been practically dissolved and will not hold another meeting.

From Chicago we have the following advices from a most reliable source: "The failure of the members of the Western Cut Nail Association to reach an amicable settlement in regard to prices and product at their meeting on the 12th inst. is likely to result in a demoralized market for some time to come. The prices at which some of the manufacturers unloaded large blocks of Nails into the hands of leading Western jobbers within the last few weeks is regarded by many as having placed the jobbers in control of the market price for several months. The manufacturer who did not sell at the extreme prices then prevailing now finds himself with a stock on hand which he cannot well dispose of to the jobbers, and he must find other purchasers or stop his factory. In endeavoring to release himself from this predicament, the only avenue of escape appears to be through the retailers. Under these circumstances, from what has already developed, it will not be surprising to hear that certain manufacturers are soliciting carload orders from the retailers through the West at figures scarcely higher than those at which

the jobber purchased in large lots of 3000 to 5000 kegs. Competing railroad lines are fighting for business, and Nails are apparently made leaders in the cut rate. June 8 the rate from Wheeling and Pittsburgh to Chicago was fixed at 11 cents per keg. On the 11th this rate was reduced to 9½ cents, and on shipments through to St. Paul 17½ cents. It may be argued that this will help the manufacturers out on the low prices previously made, but at the same time it will place in the hands of the mills the power to stock up the Western retailer, so that the jobber will be forced to sacrifice the advantages of his low prices or carry his stock. The Chicago jobber does not often allow anybody to get away with him, and in the conflict between the manufacturer and the middleman the retailer may reap the harvest."

Wire Nails.

Some opposition to the new card, June 1, is still manifested, and the Tack manufacturers are still using their former lists, and some other concerns—as, for example, the Wire Goods Company, Worcester, Mass.; American Screw Company, Providence, R. I., and Russell & Irwin Mfg. Company, New York—have not adopted the part relating to the papered goods, though it is not unlikely that they may decide to do so. There is also some opposition to the new list on the part of some of the jobbers, who regard it as impracticable to apply the card to such goods. The irregularity which results from the use of different lists is annoying to both buyer and seller, as the former will naturally closely scrutinize the prices of the different manufacturers, and buy the goods from the card or the list according as will be to his advantage, in many cases perhaps dividing the orders. The difficulty which is experienced in regard to special Nails which are not covered by the new card is also referred to. On the whole, however, the new card seems to be generally received with favor, and if it continues to be adhered to by the principal manufacturers will probably in time be adopted by most of the others, and its tendency will be to diminish the number of sizes which will be called for by the trade. It may, however, be some time before the papered goods are generally sold on the new system.

Comparatively little business has been done since the announcement of the new card, and manufacturers generally are busy filling orders at the old prices. The indications are that a base price of \$2.25 to \$2.30 for carload lots at factory about represents the market, with comparatively slight advances for less than carloads.

How It Looks in the Country.

Scene—Hardware store. Time—June 10, 1889.

Dramatis Personæ—Hardware Man and Average Customer.

H. M.—Good-morning, sir.

A. C.—Howdy. What can you sell me Wire Nails for, Mr. Hardware Man? I shall build a house and barn this season—have the foundations already laid—and shall want a good bit of Hardware. Now, make the figures low.

H. M.—Well, Average, you have always been inclined to favor me in the way of patronage, and I will make the price \$2.50, base, provided you give me all of your trade in Hardware for these buildings.

A. C.—Two dollars and fifty cents, base! I suppose that means 2½ cents per pound for what Wire Nails I want.

H. M.—No, sir. That would average less than cost. We can't do that; shall be obliged to charge you the regular mill extras.

A. C.—Well, how much will that make Shingle Nails cost me?

H. M.—Three dollars and forty cents per keg.

A. C.—That ain't bad. I shall want mostly 10d and 12d.

H. M.—The list of extras has just been changed. We shall have to charge you 40 cents extra for 10d and 35 cents for 12d.

A. C.—You don't say! Well, I suppose I shall have to stand it. I shall want some 30d and 40d for the rafters and frame and a part of a keg of Lath Nails.

H. M.—According to the new list I shall have to charge you 20 cents extra for 30d and 40d Nails.

A. C.—What do you mean? What is the base, anyway?

H. M.—Sixty-pennys.

A. C.—Thunderation! I don't want any 60d. What are you giving us, anyway? Do you claim to sell me Wire Nails for \$2.50 per keg and then charge me \$2.70 for the cheapest size that I want? What do you take me for? I always supposed that you were an honest man for a Hardware dealer, but this is the most bare-faced swindle I have ever heard of in this country.

(Exit A. C.—Enter Carpenter Builder.)

C. B.—How are you, Mr. Hardware Man? How is the Wire Nail market?

H. M.—So-so. Have you heard of the change in extras?

C. B.—Change! Have they changed it again so quick, and what for?

H. M.—Oh, the base is now 60d, with 10 cents extra for 50d, and so on, to 50 cents for 8d and 9d; then only 65 cents for 6d and 90 cents for 4s. They say that this change is necessary to make the list symmetrical, and that as at present arranged they can accept an order for any size without requiring a customer to take a certain number of kegs of small sizes to increase the average price. But here is the new card, together with the manufacturer's circular. Look them over.

C. B. (after a few moments' study)—Now, what are we to expect? We were told last year that it was necessary, in order to accept orders of the kind you name, that 60d should be sold for 35 cents more than 12d. They changed the list to obviate this difficulty and to make the list "symmetrical." Eleven months later, in order to harmonize that list, we are told that it is necessary to charge 35 cents per keg more for 12d than for 60d. This strikes me to be very like "Young America" or else there is a "nigger in the bushes." Of the two I am inclined to think that it is the "nigger." Next year they will discover that kegs cost money and charge 10 cents extra for them. In 1891 it will be found necessary to charge 2 per cent. extra on the whole card to cover insurance, and in 1892, it being the national election, they must add 5 per cent for political "soap." If they want a "base" to reckon from, why not make it \$1 per keg? Then you can sell Wire Nails cheap (until you add the extras). We are told that these goods are being sold "very close; very close, sir;" "losing money every day, sir." Why don't they charge 10 cents extra for 60d and make a profit, instead of staggering along in this way? It must be that these Wire-Nail maker will all be in the poor-house very soon. But, Mr. Hardware, think of it a moments Why, man alive! it is worse than European hotels, where tourists are charged extra for soap and candles.

H. M.—Don't be too hasty, friend Builder! By this arrangement you not only buy penny nails on this base, but also all Wire Nails, either in boxes or in pound papers. Don't you see the beauty of it?

C. B. (after a moment's thought)—Why, yes; to be sure! Don't know but I shall like that, friend Hardware Man. You will hang up a list of extras for your clerks to sell by, and when I come in to buy, say, 10 pounds ¼ No. 19 finishing, your

clerk will look up the list, and seeing that size down for \$6 I shall get my 10 pounds for 60 cents and save my "base." That's good! I have no more to say. I take it all back. The manufacturers were wise beyond their years. Good-day, sir.

MASSACHUSETTS.

Export Trade.

The demand for all classes of American merchandise continues good from the Argentine Republic, and there is every prospect of a continuance for some time. The few houses here doing that business report heavy shipments and large orders are yet in hand not placed. As long as the extraordinary immigration to that country continues and no internal trouble occurs business will be good. The west-coast trade remains very dull and is in the hands of a few large houses who have secured the cream of the business. Latest reports from South Africa show good business, notwithstanding the fact that buyers have undoubtedly been overloading, extraordinarily heavy shipments being made of Carriages and Manufactured Wood Goods, as well as all kinds of general merchandise.

The Australian mail, which arrived in installments on Saturday, we regret to say does not seem to be up to the standard, and freighters will continue to fill their vessels at probably a loss. A few of the representative merchants from the colonies are here, but are doing little or nothing in the way of making purchases; all complain of excessive freight charges and are holding back their purchases on this account. We learn that a new line of vessels to the colonies will be established when a favorable time arrives, as the capital has been subscribed; managers are only waiting for the time to arrive when money can be made or a fight instituted that in the end will be successful. There are rumors of trust combinations, &c., by some of the manufacturers engaged in the export business for the purpose of realizing a profit on their goods, but nothing definite has come of it yet.

More attention should be given by our manufacturers to packing goods for export. This is a very serious question. We should bear in mind that the freight is a very important item and importers will not pay freight on rubbish. Cases should be made to exactly take in the goods without leaving spare room. Another feature which needs attention is the packing of polished-steel goods, such as Shovels, Axes, Hammers, Agricultural Implements, &c. The vessels to South Africa, New Zealand and portions of Australia are small and apt to be wet; if goods arrive out rusty dealers loose money and will place orders with firms who pack in waterproof paper, or who use some preventive against rust. We are on the eve of a very large export trade, and manufacturers now engaged with the business should give careful attention to these points in order to hold what they have and be in a position to reap the reward which awaits them in the future.

Miscellaneous Prices.

The regular monthly meeting of the Wrought-Iron Pipe and Boiler Tube Manufacturers' Association was held in the Monongahela House, Pittsburgh, on Thursday, the 13th inst. Campbell B. Herron, chairman of the association, presided and J. B. Murdoch acted as secretary. The following named firms were represented in person:

National Tube Works Company, Pittsburgh.
Pennsylvania Tube Company, Pittsburgh.
Spang, Chalfant & Co., Pittsburgh.
A. M. Byers & Co., Pittsburgh.
Duquesne Tube Company, Pittsburgh.
Morris, Tasker & Co., Philadelphia.
Conshohocken Tube Co., Conshohocken, Pa.
Am. Tube and Iron Co., Middletown, Pa.
Oil City Tube Company, Oil City, Pa.
Riverside Iron Works, Wheeling, W. Va.

After a long discussion on the condition of trade and the advisability of advancing prices it was decided to make a slight advance only on 3, 4, 6 and 8 inch Line-Pipe. The following discounts and prices were agreed on and went into effect on Saturday, the 15th inst.

	Discount.
Butt-Welded Pipe	52 1/2 %
Lap-Welded Pipe	65 %
Butt-Welded Pipe (Galvanized)	45 %
Lap-Welded Pipe (Galvanized)	52 1/2 %
Casing, 5 1/2 inches	62 1/2 %
All other sizes	60 %
Boiler Tubes, 1 1/4 inches and smaller	55 %
Boiler Tubes, 2 inches and larger	60 %
2 1/2-inch Line-Pipe, per foot, net	\$0.16
3-inch Line-Pipe, per foot, net	0.21
3 1/2-inch Line-Pipe, per foot, net	25
4-inch Line-Pipe, per foot, net	30
5-inch Line-Pipe, per foot, net	42
6-inch Line-Pipe, per foot, net	58
7-inch Line-Pipe, per foot, net	70
8-inch Line-Pipe, per foot, net	95
9-inch Line-Pipe, per foot, net	1.20
10-inch Line-Pipe, per foot, net	1.25
12-inch Line-Pipe, per foot, net	1.60

The next meeting of the association will be held at Long Branch about the middle of July.

The Tack market has not recently experienced much change in its general features. Prices are very irregular, and there is little reason to doubt that a good many goods are sold without profit. The more conservative houses are declining to meet the extreme quotations, preferring to lose orders rather than accept them at unprofitable figures, but the margin of profit even with the most conservative management is conceded to be small. There is also a good deal of irregularity in regard to the weights of Tacks, and the many new forms in which the goods are put on the market add to the general confusion, so that unless one carefully scrutinizes the goods he cannot be sure of what he is getting. There is also a lamentable laxity in regard to the quantity of goods in given packages, and buyers will be wise to examine carefully the weight, number, &c., of all goods they are buying.

The prices of Strap and T Hinges do not improve, and there has been recently a further decline in quotations made, especially by the Western manufacturers. Some of the Eastern manufacturers are pursuing a more conservative policy, but their quotations also show a downward tendency. Wrought Butts are in similar condition, but the demoralization has not proceeded quite so far.

Boxwood Rules do not show evidences of improvement, but there has been recently a further slight decline in prices.

The Pick and Mattock Makers' Association held their semi-annual meeting in Pittsburgh on June 6. The meeting was very harmonious and satisfactory, the only changes made being a moderate advance in price of Picks, Mattocks and Grub-Hoes, the trade prices being established at 50, 10 and 5 to 60 per cent. off list. We are advised that all the manufacturers of these goods in the country are members of this association.

The following discounts are named by the Cincinnati Tool Company, Cincinnati, Ohio, relating to the line of good they are offering to the trade:

	Discount. Per cent.
Sets of Taps and Dies	15 & 10
Bench Stops	25 & 10
Washer-Cutters	25 & 10
Spoke-Shaves	25 & 10
Combination Drawer Locks	25 & 10
Screw-Drivers	20 & 10
Brace Screw-Drivers	25 & 10
New Pattern Folding Screw-Driver, 6-inch, \$3; 7-inch, \$4	net
Adjustable Bench-Clamps	20 & 10
Machinists' Clamps	15 & 10
Adjustable Screw-Clamps	15 & 10
Adjustable Boat and Ship Clamps	15 & 10
Quilt-Clamps	25 & 10
Cabinet-Clamps	25 & 10
Carpenters' Clamps	25
Extra-Heavy Carpenter's Clamps	25
Standard Clamps	15 & 10
Cabinet-Maker's Clamps	15 & 10
Adjustable Ship and Bridge Builders' Clamps	15 & 10

Cooper's Shaves	20
Box-Scrapers	25
Band-Setters	25
Gimlets	25
Brad-Awls	20
Brace-Wrenches	15 & 10
Monkey-Wrenches	15 & 10
Countersinks	25
Plug-Cutters	20
Spoke-Pointers	25
Bit-Gauge	25
Dowel-Pointer	25
Door-Hangers Nos. 3 and 4, Improved	25 & 10
Brace-Drills	30 & 5
Brace-Drills for Metal	40 & 10
Cutting-Nippers	25 & 10
Screw and Plug Bit	25
Saw-Vises, Nos. 3 and 4	20 & 10
Standard Hollow Auger	25 & 10
Adjustable Hollow Auger, No. 1	30 & 30 & 5

Items.

Buffalo Hammer Company, Buffalo, N. Y., have issued a new illustrated price-list and catalogue of their extensive line of solid-steel Tools. It represents an exceptionally complete assortment of Handled and other Hammers, Picks, Hot and Cold Chisels, Swages, Punches, Hardie's Flat-ters, &c., as well as a line of Hatchets. The company call attention to the fact that they are now located in their new works, with largely increased facilities, and are prepared to manufacture a high grade of tools. For the convenience of the trade they have adopted a new system of numbers on Hammers, doing away with all duplication, so that Hammers and Sledges can hereafter be ordered by number only, no further description being necessary. The association list and numbers are used on Hatchets. The catalogue is fully illustrated and finely printed.

The new catalogue of Hubbard & Co., Pittsburgh and Beaver Falls, Pa., is a beautiful specimen of artistic printing, and shows very satisfactorily the extensive line of goods represented in it. It is the work of Gies & Co., engravers and printers, Buffalo, N. Y., whose taste and skill are exhibited on every page. The catalogue is divided into the following departments: Axes, Saws, Shovels, Spades, Scoops and Drain Tools, Railroad Supplies and Eye Hoes. It is copiously illustrated with cuts exceptionally fine, and the different patterns of Axes are shown in *fac-simile*, colors of labels, &c., being accurately reproduced. Side and edge views of the different Axes are given. In some of the cuts the edge and poll are given, also the swell or ridge on the center of the blade, thus showing not only the exact shape but the thickness of the head or poll of each Axe. The effect produced by the gold bronze and the striking colors is very attractive and the brilliant corner-piece on each page adds materially to the beauty of the book. In the different departments there are copious illustrations showing the patterns of the different goods. It is worthy of notice that each of the divisions of the book is preceded by a sheet for quotations on the line of goods in the division which follows, so that the prices are thus given in close connection with the goods to which they relate, instead of being, as usual, at the beginning or ending of the book, or in a separate sheet. It is also suggested to the customers of the house that the book as sent be not mutilated, and it is stated that loose pages printed on one side only for the use of salesmen will be furnished on application. This catalogue, which has been not inappropriately referred to as the finest catalogue in the trade, will be valued by those who receive it, and bears evidence of the enterprise of the house that issues it.

Walter W. Woodruff & Sons, Mount Carmel, Conn., have issued a new catalogue illustrating their line of Carriage Hardware and other manufactures, their Mount Carmel Ox Shoes being prominently represented. The catalogue is excellently printed on fine paper. Special attention is directed to the large assortment of special band patterns. They also allude

to their new special process of electroplating, combining the use of nickel as a base with a heavy coating of silver. This catalogue will be received with interest as covering a desirable line of goods and evidencing the progress and enterprise of the house.

Announcement is made under date June 1 that the copartnership heretofore existing between A. E. La Tour, Emil Jetter and Edward Jetter, Buffalo, N. Y., under the firm name of the Jetter Mfg. Company, has been dissolved by mutual consent. The business will be carried on under the same firm name by Emil Jetter and Edward Jetter, A. E. La Tour having retired from the firm.

The Henry Sears Company, 75 and 77 Wabash avenue, Chicago, Ill., issue a comprehensive 50-page price-current illustrating an extensive line of Cutlery, including Table and Pocket Scissors and some specialties. A great many illustrations are given, with list prices.

De Grauw, Aymar & Co., 34 and 35 South street, New York, are issuing a handsome illustrated catalogue and price-list which relates to Cordage, Oakum, Wire Rope, Chains, Anchors, Oars, Blocks and Cotton and Flax Ducks, Russia Bolt Rope, Bunting, Flags, Marine Hardware and Ship-Chandlers' Goods generally. It is neatly printed and well arranged.

Sargent & Co., New Haven, Conn., and New York, issue a number of new pages for insertion in their 1888 catalogue. They refer to their line of Locks, Knobs, Door Furniture, &c., and include also some new Hooks, Sash-Lifts, Transom-Lifters, Scandinavian Padlocks and the present Screw list.

The Hollow Cable Mfg. Company, Hornellsville, N. Y., report that they are enjoying a good trade in their line of goods, namely: Preston's Patent Hollow-Cable Clothes-Lines, Braided Barbless Fence Wire and Braided Box Bands. Their Fence-Wire trade is alluded to as active and increasing, the Wire being regarded with especial favor by breeders of fine stock, making as it does a strong, light and cheap fence which is not liable to break in cold weather from contraction.

Obituary.

J. B. Shannon, well known to the Hardware trade as senior member of the firm of J. B. Shannon & Sons, Philadelphia, Pa., died in that city on June 9 at the advanced age of 71 years. Mr. Shannon was among the early Hardware men, being in the store of Peter Rodgers, and in 1846 became a member of the then new firm of Little, Hatrick & Shannon, all former employees of Peter Rodgers, this firm being shortly afterward succeeded by Little & Shannon, and again in 1854 by J. B. Shannon. From 1858 to 1884 he was located at 1009 Market street, and then moved to the present site, a large five-story building, 1020 Market street, and on July 1, 1878, took into the firm three of his sons—Alfred P., Edwin H. and David W.—under the present style of J. B. Shannon & Sons. Mr. Shannon was always of an inventive turn of mind, and has devised many useful articles for the hardware and building trades, but realized nothing from his inventions, as none were ever patented. He was the first in the United States to use electrical annunciators in hotels, and among the first to make gas-burners in this country. The sliding-roller door originated with him, which, by the way, was an accident, not an invention. As a business man Mr. Shannon stood high in the estimation of the community and was sincere and devoted to many interests in his city, and was one of the most active and energetic men of his time.

Relief for the Johnstown District.

The following is a further list of contributors to the relief fund for the sufferers by the flood in the Conemaugh Valley, the contributions below being secured by Geo. V. Smith, sales agent Cambria Iron Company (Gautier Steel Department,) 104 Reade street, New York:

Dunham, Carrigan & Hayden Co. and employees, New York.....	\$162.00
S. Otis Livingston, New York.....	100.00
David Williams, New York.....	100.00
Vought & Williams, New York.....	100.00
Huntington, Hopkins Co., New York.....	100.00
Wm. Jessop & Sons, Lim'd, New York.....	100.00
W. H. Wallace & Co., New York.....	100.00
D. G. Gautier & Co., New York.....	100.00
Egleston Bros. & Co., New York.....	100.00
Mrs. C. D. Carpenter, New York.....	100.00
H. W. Johns Mfg. Co., New York.....	100.00
Penn & Lee, Syracuse, N. Y.....	100.00
Cortland Wagon Co., Cortland, N. Y.....	100.00
Fowler Nail Co., Seymour, Conn.....	100.00
Pierson & Co., New York.....	100.00
Richardson Mfg. Co., Worcester, Mass.....	100.00
Bellows & Manson, Boston, Mass.....	100.00
H. L. Hoyt & Co., Victoria Hotel, New York.....	100.00
Thomas F. Russel (Gautier Steel Department, 104 Reade street).....	100.00
Geo. V. Smith (Gautier Steel Department, 104 Reade street).....	100.00
Reformed Church, Greenpoint, L. I.....	86.50
F. W. Wurster & Co.'s employees, Brooklyn, N. Y.....	52.25
J. C. McCarty & Co., New York.....	50.00
John H. Graham & Co., New York.....	50.00
Gilbert, Sweet & Lyon, New York.....	50.00
J. J. Richards & Co., New York.....	50.00
Abeel Bros, New York.....	50.00
Horace Dennitt, New York.....	50.00
American Mfg. Co., New York.....	50.00
F. W. Wurster & Co., Brooklyn, N. Y.....	50.00
C. H. Tiebout & Sons, Brooklyn, N. Y.....	50.00
Boutwell Bros., Lowell, Mass.....	50.00
Jas. W. Eager and W. H. Niven, Syracuse, N. Y.....	50.00
Howe & Co., Troy, N. Y.....	50.00
J. Thomson & Bro., New Orleans, La.....	50.00
Employees of H. W. Johns Mfg. Co., New York.....	40.00
Employees of John H. Graham & Co., New York.....	33.50
Hogan & Son, New York.....	25.00
Smith, Lyon & Field, New York.....	25.00
Henry B. Newhall, New York.....	25.00
Heller Bros., Newark, N. J.....	25.00
W. H. H. Sisum, Brooklyn, N. Y.....	25.00
Nelson & Call, Cortland, N. Y.....	25.00
Winter & Ball Mfg. Co., Jersey City, N. J.....	25.00
Thompson Bros., Malone, N. Y.....	25.00
W. W. Conde, Watertown, N. Y.....	25.00
D. G. Delany, Newark, N. J.....	25.00
Merriam Bros., Waverly, N. Y.....	25.00
J. S. Crane & Co., Newark, N. J.....	25.00
Southington Cutlery Co., Southington, Conn.....	25.00
F. A. Houdiette & Co., Boston, Mass.....	25.00
H. C. Marshall, New York.....	25.00
W. Eddy & Sons, Greenwich, N. Y.....	25.00
Wm. H. Field, Port Chester, N. Y.....	25.00
Ed. Schedler, New York.....	10.00
C. Romaine, New York.....	10.00
Cash, New York.....	10.00
W. E. Pruden, New York.....	10.00
Matthew J. Nunan, New York.....	10.00
E. Winsor & Co., Providence, R. I.....	10.00
Beals & Brown, Buffalo, N. Y.....	10.00
C. W. Palmer & Co., Herkimer, N. Y.....	10.00
Bacon & Co., Boston, Mass.....	10.00
McBarron & Maxwell, Boston, Mass.....	10.00
L. S. Winne & Co., Kingston, N. Y.....	10.00
Employees of Sahler, Reynolds & Webster, Rondout, N. Y.....	10.00
Terry Mfg. Co., Horseheads, N. Y.....	10.00
W. H. Wild, Valatie, N. Y.....	10.00
Geo. Sweet & Co., Dansville, N. Y.....	10.00
F. Alexander & Co., Staunton, Va.....	10.00
Cash, New York.....	5.00
Lewin & Goodnoe, Schenectady, N. Y.....	5.00
F. R. Stout, New Brunswick, N. J.....	5.00
Cortland Mfg. Co., Ltd., Cortland, N. Y.....	5.00
John Merkle, Jr., Newark, N. J.....	5.00
A friend.....	1.00
Total.....	\$9,535.25

The following is the list of contributions by the Hardware and Iron merchants of Chicago for the relief of the sufferers in the Conemaugh Valley:

O. W. Potter, Illinois Steel Co. (sent direct).....	\$500.00
Frazer & Chalmers.....	500.00
Crane Bros. Mfg. Co.....	500.00
John Crerar, Crerar, Adams & Co.....	500.00
Frazer & Chalmers' employees.....	304.15

Hibbard, Spencer, Bartlett & Co.....	\$250.00
Adams & Westlake Co.....	250.00
Thomson Electric Co.'s employees.....	212.50
J. T. Ryerson & Son.....	200.00
Link Belt Machinery Co.....	200.00
David Bradley Mfg. Co.....	200.00
E. W. Blatchford & Co.....	150.00
National Tube Works.....	100.00
W. S. Mallory & Co.....	100.00
A. Plamondon Mfg. Co.....	100.00
Ames Iron Works, Chicago branch.....	100.00
Horton, Gilmore, McWilliams & Co.....	100.00
Markley Alling & Co.....	100.00
A. F. Seeberger & Co.....	100.00
Gates Iron Works.....	100.00
Jas. B. Clow & Son.....	100.00
Pickands, Brown & Co.....	100.00
Baker, Smith & Co.....	100.00
Raymond Lead Co.....	100.00
C. Sidney Shepard & Co.....	100.00
Gormully & Jeffrey Mfg. Co.....	100.00
J. A. Fay & Co.....	100.00
Norton Bros.....	100.00
Wells, French & Co.....	100.00
Chicago Malleable Iron Co.....	100.00
M. Benner & Co.....	75.00
Western Electric Co.'s employees.....	60.00
M. C. Bullock Mfg. Co.'s employees.....	57.00
Chicago Screw Co.'s employees.....	60.00
J. J. Glessner.....	50.00
Chicago Stamping Co.....	50.00
Fairbanks, Morse & Co.....	50.00
J. F. Wollensak.....	50.00
Goulds, Austin & Caldwell.....	50.00
M. Greenbaum's Sons.....	50.00
M. C. Bullock Mfg. Co.....	50.00
C. H. Besley & Co.....	50.00
Wells & Nelligar.....	50.00
Chicago Rubber Works.....	50.00
Moorhead, McClean Co.....	35.00
Holmes, Pyott & Co.....	25.00
A. J. Kirkwood & Co.....	25.00
Vaughan & Bushnell Mfg. Co.....	25.00
National Boiler Works.....	25.00
Chas. Elms.....	25.00
J. A. Miller & Bro.....	25.00
H. Rendtorff & Co.....	25.00
Lalance & Grosjean Mfg. Co.....	25.00
Kellogg, Johnson & Bliss.....	25.00
C. H. Gurney & Co.....	25.00
S. J. Surdam & Co.....	25.00
E. Hunt's Sons.....	25.00
N. B. Williams.....	25.00
Moriatta Iron Works.....	25.00
E. Baggott.....	25.00
Mortimer McRoberts.....	25.00
Chicago Scale Co.....	25.00
Orr & Lockett.....	25.00
Electric Supply Co.....	25.00
Chicago Raw-Hide Mfg. Co.....	25.00
Curtis & Co.....	25.00
Anson Sperry.....	25.00
Borden, Selleck & Co.....	25.00
Cutler, Woodrough & Co.....	25.00
Gilbert & Bennett Mfg. Co.....	25.00
Clinton Wire Cloth Co.....	25.00
King & Andrews Co.....	25.00
Harrington & King Perforating Co.....	25.00
Chicago Hardware Mfg. Co.....	25.00
Vulcan Iron Works.....	20.00
John Davis Co.....	20.00
Chicago Spring Butt Co.....	10.00
Dennison & Hamilton.....	10.00
Scoville Mfg. Co.....	10.00
Kieckhefer, Bartling & Co.....	10.00
Illinois Wire Nail Co.....	10.00
Taunton Tack Co.....	5.00

Charles M. Biddle, treasurer of the Philadelphia Hardware Relief Fund for the Johnstown sufferers, reports the following additional subscriptions:

I. B. Seeley.....	\$5.00
American Machine Co.....	100.00
Employees American Machine Co.....	79.00
Charles R. Ruchener.....	5.00
Mrs. S. F. Midwinter, Oceanic, N. J.....	10.00
Palmer Street School.....	.17
Wm. Rose & Bro.....	32.00
Ensign, Bickford & Co., Simsbury, Conn.....	100.00
Employees Job T. Pugh.....	9.50
De Witt, Morrison & Kelley.....	30.00

The entire amount thus contributed is reported as follows:

Through Drexel & Co.....	\$3,274.00
Through Jobbers' Committee.....	3,164.25
Through Manufacturers' Committee.....	3,062.91
Through Retailers' Committee.....	966.72
Total.....	\$10,407.88

Hardware Interests at Williamsport, Pa.

While the well-nigh unparalleled disaster in the Conemaugh Valley has to a large degree engrossed public attention, the destruction of life and property at Williamsport, Pa., has not received the appreciation that it would otherwise have had; but its merchants as well as others

have been overtaken by a calamity which, besides the destruction of life and property, disturbs the regular order of business and may call for indulgence on the part of their creditors. Having 7½ or 8 feet of water on the floor of a Hardware store, while logs by the million feet and houses by the dozen are swept by the door, has a disquieting and damaging effect upon trade. In view of the unsettled condition of things and the disturbance of business, the Hardware merchants of the city have been conferring; and while efforts are being made as quickly as possible to return things to their normal course, and to carry on trade as before, the following circular letter has been addressed to wholesale dealers and manufacturers of Hardware and all other goods sold by the Hardware trade. The reasonableness of this appeal will be recognized, and will, we doubt not, have a hearty response from those to whom it is addressed:

WILLIAMSPORT, Pa., June 12, 1889.

We, the undersigned Hardware dealers of Williamsport, Pa., desire to call your attention to the condition of the Hardware trade in this section. By the omnipotent power of an all-wise God, we are sufferers by the late overwhelming floods, which devastated our city and submerged in most cases our entire stock of merchandise. The loss among the Hardware dealers is larger than in any other line of merchandise. For us the labor of years has been swept away. Our loss is great, but our grit and nerve are still with us, and we desire to have our affairs adjusted so that we can continue business and make a success of the future, as we have of the past. Our trade being mostly among lumber men and house-builders, who, of course, are great sufferers, a danger still greater than the actual loss of our goods stares us in the face, from the fact that many of those to whom we have been selling goods are from the very same cause rendered incapable of paying what is due us. We cannot force collections even if we desired, because in hundreds of cases their houses and property have been swept away, and those who were in good circumstances a month ago are insolvent to-day. Public sentiment here would decry legal proceedings of any kind; and inasmuch as some of us may need your assistance in this hour of our adversity, we hope, should any of us seek an extension of time on goods purchased before June 1, 1889, that you will grant such an extension as may be deemed necessary.

Respectfully,

KLINE & Co.
LEWARS & Co.
WILLIAMSPORT HARDWARE AND
STOVE COMPANY, LIMITED.
T. J. FUNSTON & Co.
F. H. KELLER & Co.
A. B. NEYHART & Co.
BECK BROS. & Co.

Trade Topics.

Our readers will remember that a few weeks ago we published an extract from an article in the *Commercial Bulletin* of Los Angeles, Cal., relating to the appointment of Pacific Coast agencies, with headquarters at San Francisco, in which the point was made that such agencies are not satisfactory to the business men of Los Angeles, while reference at the same time was made to the growing importance of that city as a trade center. From a prominent Hardware house of that city we have received a letter bearing upon this subject, in which it is pointed out that the position of the newspaper from which we quoted is untenable, inasmuch as Los Angeles agencies are pretty well established and the commission business well represented in that city. Our correspondents say:

The writer of the article in the *Commercial Bulletin* evidently is not acquainted with the trade of Los Angeles. To one who has been in business here for any length of time it would seem rather strange that there are no commission agents in the Southern country. The fact is there are a great many of them, and a majority handle goods directly from the East, receive orders and transmit them to manufacturers without being in any way connected with San Francisco houses. Almost all lines of goods are represented in that way, and there are so many firms who are doing a commission business that we doubt if more than one or two of them are making any money.

The majority of the business houses here either have their representative buyers in the East who are purchasing for them and taking advantage of the market, or else they are such small dealers that they are unable to buy any quantity large enough to ship from the East. In this way it makes the success of the commission houses rather doubtful. The same rules which would govern the commission houses in the East will not control the business here, because the distance from the market and the quantity of goods which must be ordered to obtain advantage of the lowest freight will allow but comparatively few houses that are now doing business here to order through these agents. Another reason is that most of these commission merchants have opened up business since trade here has decreased, and at a time when the majority of the houses were overstocked. In time undoubtedly there will be a good opening for them here, but we must differ with the account in the *Commercial Bulletin*, that they are subservient to San Francisco houses and have no headquarters here dealing direct with the manufacturers.

We have also the following advices bearing upon the same question, in which our correspondents refer to the mistakes sometimes made in regard to Pacific Coast agencies, and referring also to the importance of Los Angeles as a trade center:

The Eastern manufacturers make a mistake in establishing agencies for the Pacific Coast with headquarters at San Francisco, and a greater mistake when they give the exclusive sale of their goods for the Pacific Coast to San Francisco jobbers. A fair example is in the Granite-Ware manufacture. Because San Francisco sold Granite-Ware when Southern California, you may say, was a wilderness, Los Angeles merchants in a city of nearly 100,000 inhabitants must buy their supply in San Francisco! As well ask the jobbers of Chicago to get their supply from Buffalo. San Francisco has lost its grip on this part of the State. Goods in the Hardware line are sold at better figures here than in San Francisco. When the Interstate Commissioners give us the benefit of the short-haul clause of the law San Francisco cannot compete with us. Why should she, being over 500 miles further from the Eastern markets? Los Angeles will be in the future as it is now the metropolis of Southern California. Notwithstanding the business depression, as a consequence of the great real-estate excitement, the city is advancing rapidly in population, as well as all Southern California. The costly and permanent improvements going forward in this city and part of the State show the confidence that the people that know this section of our country best have in its future. It is a section that the Eastern manufacturer of Hardware cannot overlook.

The freight question in Iowa continues to attract much attention and there is a good deal of feeling in regard to it. The roads running through the State have, we are advised, taken off many of their passenger trains on north and south lines and lessened their other trains, and are changing their time-tables needlessly in order to coerce the acceptance of their freight rates. With a view to getting at the merits of the case and to obtain information the Governor is sending out printed circulars to the shippers of the State propounding these questions:

1. How do the local freight rates of the railroads patronized by you compare with the rates in force two years ago?
2. Are the present rates satisfactory to the shippers of your locality?
3. If they are not satisfactory, state in what respect the present tariffs are deemed deficient or unjust.
4. Has the passenger service in your locality deteriorated, and if so, to what extent?
5. Are you in favor of State control of railroads?
6. What railroad legislation, if any, would you recommend for the future?

The controversy is evidently waxing warm, and it remains to be seen what the outcome will be.

The proper organization of a business house with a view to economy and efficiency of administration in the different departments is an important matter which is touched upon by a Western correspondent, who says:

I find many firms made up of a practical Hardware man and tinner who have their different departments in charge. In many cases in addition to these a third has been associated with the other two, who takes charge

of the books and collections. Having one partner, each acquainted with a particular kind of work, doing the buying for that department, puts the business on an excellent basis, as each is responsible for a certain part of the results.

We have the following advices from Louisville, Ky., under date June 8:

The Hardware trade of Louisville, Ky., is remarkably good for this season of the year. It is a source of wonder where the enormous volumes of goods go to, as the spring trade was remarkably large, and now that the farmers are busy in the fields, it is hard to say who buys the goods from the retailer, for he is patronizing the jobber very liberally. For some time a continued drought made dealers hold back in the tobacco and cotton sections, but now plentiful rains insure the crops to be fair anyhow. More agricultural machinery than usual has been bought this season than formerly. Bar-Iron and Merchant Steel are in fair demand, and many inquiries coming from Southern quarters show that the Birmingham mills must be full, as the Southern mills have latterly supplied the trade. Sheet-Iron is quite stiff, few mills being able to take new orders. The extreme low prices of Cut and Wire Nails are having the effect of some heavy buying, many mills refusing orders at lower figures; so now the buyers believe the manufacturers cannot go much lower and run. The approaching season for the low water in the river and annual labor troubles compel the mills to call somewhat of a halt. From the amount of Nails and Wire going out one might suppose that all the barns and fences in the Central and Southern States were down, if it were not for the fact that this vast country is fast opening up and being improved, new railroads going out in all directions, and cheap goods are aiding the good work of progress. The Barb-Wire mills are remarkably busy for this season, as many cases are reported of delayed shipments and refusals of large orders. The unlicensed Wire manufacturers are making strenuous efforts through their Cincinnati office to induce dealers to fearlessly take hold of their Wire, and of course it has a depressing effect on other makes, as it is sold 5 cents below ordinary quotations. Builders' Hardware is rapidly going out, and Wagon and Carriage goods show a lively trade. In fact, the jobbers report extraordinarily large sales during May, and trial-balances show satisfactory figures for the closing six months.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Oils.

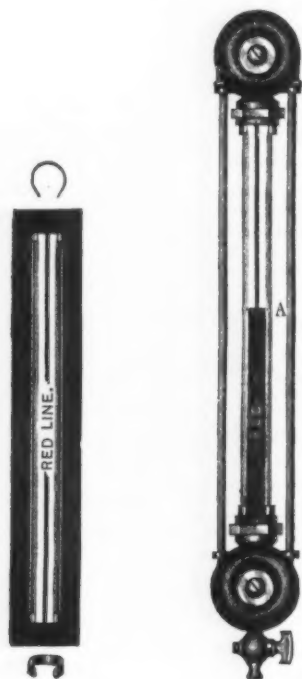
There have been no striking features in the market for animal and vegetable Oils. Outside of the ordinary jobbing movement there is little going on at the moment, and surface appearances suggest a conservative disposition on the part of buyers generally. Prices have undergone comparatively unimportant variation.

Linseed Oil.—The position is practically the same as described last week. Seed continues high, with only moderate supplies on the spot, very little "outside" Oil comes this way, and city crushers are disposing of the bulk of their current output. Prices remain very firm on the basis of 60 cents for city brands of Raw.

Cotton-Seed Oils.—In the local market business has been of rather small volume and the demand moderate. Supplies here consist mainly of "off" grades, and while these may be had at some modification of

American Water-Gauge Reflector.

It is a conceded fact that the reflecting feature found in the French red-line reflecting gauge glasses is a very decided advantage over the well-known Scotch gauge tubes. The former have upon them a narrow red line which is greatly magnified by the water in the tube, so that the height of the water is made remarkably distinct, as it is indicated by a very broad red line. This desirable end has now been accomplished by Pancoast & Maule, of Philadelphia, Pa., who by means of a very simple addition provide an ordinary tube with all the advantages of the French. As shown by cuts, the reflector consists simply of a narrow concave strip of light copper, coated all over with white enamel, having a longitudinal red stripe, similar to that on the French glass. This strip fits neatly against the glass, and is held in its proper position by two small steel clasps, and as a result an optical illusion,



American Water-Gauge Reflector.

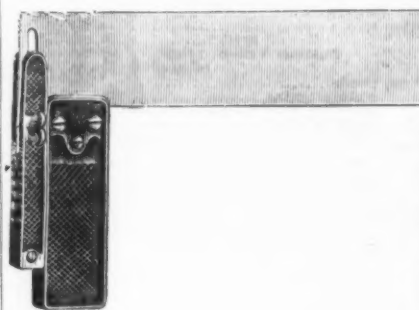
precisely similar to that produced by the French red-line glass, is obtained on any water-gauge to which the reflector is attached. In gauges fitted with the American reflector the water with which the tube is partially filled appears to be of a brilliant red in color, and the height of it can be noted in an instant at a distance of 50 feet or more. On boilers which are located in basements, cellars or other places where the light is poor, such as steamers, mines, &c., the American reflector will be found a very valuable assistant to the engineer or stoker.

The Fox Adjustable Try and Bevel Square.

This article is manufactured under a recent patent by the Bridgeport Steel Cutting Company, Bridgeport, Conn. It is represented in the illustration herewith. From this it will be seen that it consists of a try-square with an attachment on the back of the handle by means of which it is readily converted into a bevel, which is easily given a variety of adjustments, by means of which it can be set for any pitch or angle. The bevel attachment is a sliding bar on the back of the handle, and on it are marks for pitches from 7 to 16 inches, and another mark on the back of the square blade, which is used in giving

the adjustment desired. For example, in order to obtain a 7-inch pitch the sliding bar is placed in such a position that the mark 7 is in an exact line with the notch cut in the back of the square blade, and it is fastened in that position by means of the thumb-screw, when by placing the top of the slide and the rounding corner of the handle against the work the line of the blade will indicate the correct

bevel or pitch desired. In the same manner it may be adjusted for a pitch of either 8, 9, 10, 11, 12, 13, 14, 15 or 16 inches. The marks for octagon or pitches of 5 and 6 inches are on the top of the slide, there being a corresponding notch in the top of the blade. It will thus be seen that this ingenious and well-made tool can be set instantly to any pitch or rise from 5 to 16 inches without the aid

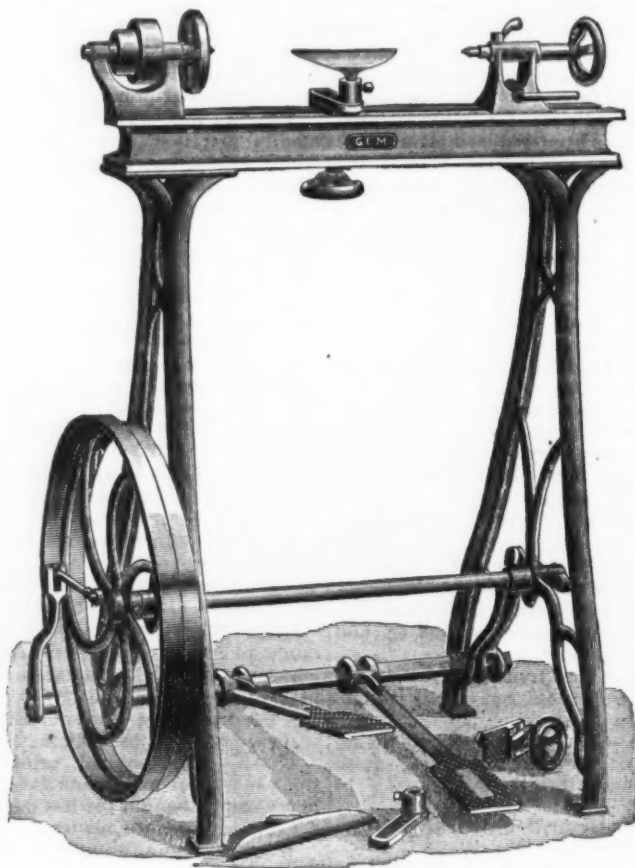


The Fox Adjustable Try and Bevel Square.

of other tools, and combines in convenient form the try, bevel and miter square, and is thus adapted to a wide variety of uses. It is also to be borne in mind that when set for any pitch or angle the try-square can also be used. The quality of the workmanship and the accuracy of the tool are other points to which the company directs attention. Its price, 8-inch, is \$15 per dozen, with a discount to the trade.

The Gem Lathe.

The lathe here illustrated was designed by the Seneca Falls Mfg. Company, of Seneca Falls, N. Y., to meet the demand for a light, substantial and practical working lathe at a low price. It is provided with a patent foot-power by which the greatest power is produced with little fatigue. This consists of double treadles



The Gem Lathe.

having a walking motion and which are movable and work independently of each other. They are connected to the opposite ends of the driving-wheel shaft in such a manner as to produce a strong, positive and continuous power. The lathe may be driven by either treadle standing or both treadles sitting. The head-stock has a two-speed cone for a 1-inch flat belt, hollow steel spindle having a $\frac{1}{4}$ -inch hole and anti-friction metal-lined boxes, which are adjustable to take up wear. The tail-stock has a steel spindle with self-discharging center. A slide-rest and a counter-shaft can be furnished with the lathe when desired. The lathe weighs 110 pounds.

The Colby Wringer.

One of the points emphasized by the Colby Wringer Company, Montpelier, Vt., in regard to the Colby Wringer, of which we gave a description last week, is the fact that when removed from the tub the rolls are relieved from pressure. By an erroneous substitution of *can* for *cannot* a contrary statement was made in the article, where it was asserted that the wringer *can* be removed from the tub without at the same time taking the pressure off the rolls. This point is an important one in the machine, as it will be perceived that the wringer is thus given greater durability, inasmuch as when not on the tub its rolls are entirely free from the injury that results from continued pressure, which robs them after a time of their elasticity.

Galvanized Tea-Kettle.

The accompanying illustration represents a new galvanized sheet-metal tea-kettle which has recently been placed on the market by Sidney Shepard & Co., Buffalo, N. Y., who refer to it as a novelty of merit, it being light, serviceable and reasonable in price. It is galvanized

*Galvanized Tea-Kettle.*

after being put together, thus soldering all the seams and coating the entire surface so as to prevent rusting. Apart from the objections that exist to the use of galvanized metal for cooking purposes, or in connection with water which is to be drunk, this article would appear to be possessed of advantages which will commend it to the trade.

The Double-Case World Type-Writer.

This type-writer is put on the market by the Pope Mfg. Company, Boston, Mass., and is represented in the accompanying illustration. The single-case World type-writer has been on the market for two years, but the double-case machine, which writes both capitals and small letters, has only recently been offered to the trade. The illustration pretty clearly indicates its construction. It writes 76 characters, including capitals and small letters, numerals and punctuation points. With the exception of being $\frac{1}{2}$ inch wider, it occupies the same space as the single case and its operation is the same. The compactness of this machine is referred to as giving advantages: It is 12 inches in length, 6 inches wide, 2 $\frac{1}{2}$ inches high and weighs a little less than 4 pounds. Consequently it can easily be placed in a convenient position on the desk or in the drawer, not necessitating a table or a change of position when a letter is to be written. The principle of indicating with one hand and printing with the other

*The Double-Case World Type-Writer.*

is referred to as giving this machine a speed which is not attained in others of its class, which are operated with only one hand. The direct printing of the types on the paper is also alluded to as giving a better impression than it is possible to obtain where a ribbon is used. It is also pointed out that no amount of use can change the alignment and the cost of repairs is trivial. The construction is such that the friction is reduced to a minimum. A neat walnut

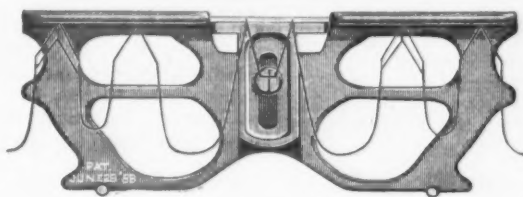
case fitted with a handle is made for the machine and is convenient for carrying it about. It has less than 40 parts and employs but one active spring. It is light and strong and seldom needs repairing and is practically indestructible. The following additional particulars in regard to this machine, with some reference to type-writers in general, are furnished us by the company:

It does not get out of order easily, the alignment is perfect, the parts are all interchangeable, it employs no ribbons to dirty the fingers, writes on paper of any width or thickness, will address envelopes, postal-cards or tags more easily than any other type-writer. For filling in blanks it cannot be excelled. Its writing will copy-press better than a letter written with copying-ink. It can be used in connection with hektograph and a large number of perfect copies taken. It is easy to carry, and many traveling men who for years have wrestled with a hotel pen claim that they cannot get along without it. It takes very little practice to learn to work the machine rapidly. Its action is positive and it cannot lap or skip. Simplicity is one of the points of the machine. In 15 minutes an ordinarily intelligent person can write almost as rapidly with this type-writer as with the pen. With an hour's practice a day for a week one can write 50 per cent. more rapidly than with the pen.

The single case machine writing 44 characters is sold for \$10, and the double case, writing 76 characters, as above mentioned, is sold for \$15.

Giant-Saw Tool.

E. C. Atkins & Co., manufacturers of saws, tools and mill specialties at Indianapolis, Ind., with branches at Memphis, Tenn., and Minneapolis, Minn., have re-

*Giant-Saw Tool.*

cently brought out a new tool to be used in the care of cross-cut saws. It is called the Giant-saw Tool and is a combined jointer, raker, tooth gauge, side file and set-tooth gauge, all comprised in one tool, and is described as a most perfect tool for the purpose made. It is represented in

the accompanying illustration. They have decided to place this tool on the market at popular prices, the retail price being 50 cents and the price to dealers \$4 per dozen.

The Cleveland Foundry Company, of Cleveland, are now interested in the Favorite Desk and Slating Company, makers of the Favorite school desk. Their office is with the Cleveland Foundry Company.

Ice-Making Machines.

The accompanying illustrations represent portable ice-making machines of foreign manufacture which are being introduced by the Francis T. Witte Hardware Company, 106 Chambers street, New York.

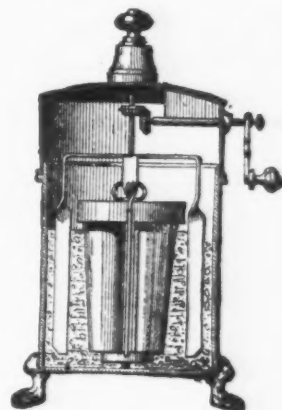
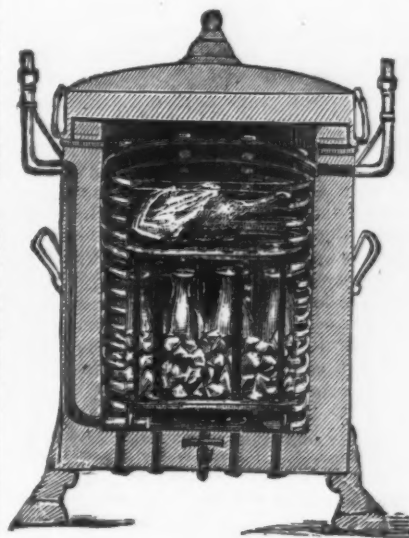
*Ice-Making Machine—Regular Pattern.*

Fig. 1 represents the usual pattern of the smaller sizes, Fig. 2 being a larger machine for restaurants and confectioners. From these illustrations, which show the inside arrangement of the machines, it will be seen that the receptacle which holds the water is turned by a crank similarly to an ice-cream freezer, there being around it a packing of special salts. The operation

of freezing is said to occupy 10 or 15 minutes. The smallest machine, No. 0, is for the production of $\frac{1}{4}$ pound of ice, the larger ones making 1 pound, 1 $\frac{1}{2}$, 2, 4, 6, 9 or 18 pounds each. The salts, we are

*Ice-Making Machine for Restaurants, &c.*

advised, can be used over and over again by ebullition—that is, by putting the used and wet salts on a stove and allowing the water to evaporate. It will thus be seen that the ice is not produced by this ma-

chine in large quantities, but the machines are alluded to as valuable adjuncts to the kitchen outfits of yachts, camping parties, or in countries where ice cannot be obtained.

NEW PUBLICATIONS.

ELECTRICAL RULES, TABLES AND FORMULÆ. Illustrated; Andrew Jamieson; Industrial Publication Company, New York, publishers. Price 75 cents.

This book gives what has long been needed—a clear and concise explanation of the rules and formulæ relating to electricity, together with tables on the same subject. The book will be appreciated by the electrical engineer, and also by the many users of electrical appliances, since the definitions it contains are so clearly explained as to be readily understood, even by those who are not electricians.

PRACTICAL IRON FOUNDING. By the author of "Pattern Making," "Lockwood's Dictionary of Mechanical Engineering Terms," &c.; illustrated; Whittaker & Co., London; D. Van Nostrand Company, New York, publishers.

In a condensed and clear style an admirable definition of the principles and practice of iron-founding, aided by well-selected drawings showing the practice, is given in this work. The book begins with a discussion of the principles underlying iron-founding. Then follows a description of sands, tools, green-sand molding, machine-molding, cupolas and blast, &c. The work will be a valuable aid to those studying foundry-work, and will be of much assistance to any one who is interested in the subject. The appendix contains many useful tables relating to founding.

THE ART OF SPECULATION. By Roderick H. Smith, 6 Wall street, New York. 48 pages flexible cloth cover.

This is an ingenious work, intended as a guide to speculation in Wall street. The mode of procedure laid down is founded upon the rule of averages, the speculator buying a lot at every 1 per cent. decline and selling a lot at every 1 per cent. advance. The mathematical demonstration of the success attending the adoption of this rule appeals to the reason of the reader, but the author very decidedly proves also that capital is required, and that small operators are shut out.

MANUAL OF AMERICAN WATER-WORKS. M. N. Baker, editor *Engineering News*, New York, publisher.

For several years past our contemporary *Engineering News* has issued in book form a condensed history of the water-works of the United States and Canada. The new edition brings the classification down to date, and contains accounts of all those water-works which have been erected since the appearance of the former edition. This work is received as an authority upon water-works history, and is of great value to all those interested in the subject, because of the vast amount of reliable information it contains relating to all sources of water supply.

A HISTORY OF THE PLANING MILL. By C. R. Tompkins, M.E.; John Wiley & Sons, New York, publishers. Price, \$1.50.

The writer of this book, having been for 40 years or more identified with planing-mill machinery, speaks with confidence of the designs now well known and also of the needs of this important branch of mechanics. Opening his work with an early history of the planing-mill and the early inventions in England, he follows with descriptions showing the gradual advances and improvements made up to the present time. He then deals with the

practical operation of wood-working machinery and the adjusting and working of these appliances. Although the book is headed "A History of the Planing Mill," it is really a discussion of the construction, care and management of wood-working machinery in general, the subjects treated including the various kinds of wood-working machinery, lubrication, hints about molding-machines, responsibilities of foremen, advice to operators, artistic wood-work, shafting, belting, &c.

HOT-WATER HEATING AND FITTING OR WARMING BUILDINGS BY HOT-WATER HEATING APPARATUS, THE METHODS OF THEIR CONSTRUCTION AND THE PRINCIPLES INVOLVED. By William J. Baldwin; 385 pages; over 200 illustrations and diagrams, and 15 tables. Published by the *Engineering and Building Record*. Price, \$4.

The subject of warming buildings by hot water is attracting so much attention upon the part of the public at large at the present time, and is having such special study upon the part of all who are engaged in any branch whatsoever of the business of heating and ventilation, that the appearance of a manual or compendium devoted to it is of great importance. That the book should come from the pen of a writer so well known to steam engineers and to the readers of the technical press in general as William J. Baldwin gives it still further claims to examination, and demands for it careful scrutiny and intelligent criticism. The work has been prepared not alone for purely professional readers, but rather for the mechanic and hot-water heating fitter, as the amount of new matter which it contains relates chiefly to fittings rather than to the principles of heating. The greater portion of the matter contained in this book first appeared in the pages of the *Engineering and Building Record* in a series of articles. Since their appearance in that periodical they have been revised, and considerable new matter has been added pertaining to the subject above indicated.

Considering the work as a whole, it can only be regarded as a small original contribution to hot-water heating literature. The greater part of it is taken up with reiteration of experiments of some of the earlier investigators. Much time has been given to the calculations based on the accepted hydraulic formulas, but the space occupied in the explanation of how these calculations were made is of small importance to the practical reader. The results of this figuring are of use, and the methods proposed for proportioning and grading the sizes and areas of pipes might, with great advantage, receive more elaboration. Tables, in addition to the diagrams, giving the actual sizes of pipes and surfaces would have been very desirable. The information regarding the proportions of pipes is of benefit to the practical man, and for this alone the book becomes a useful addition to the engineer's library. The effort is more the work of a student of engineering authors than that of a practical mind, as an illustration of which we would cite the assumption of the temperature of the water in the radiators when calculating the heating surface. In the radiators in the greater number of buildings it is not common to get the temperature of the water entering the radiators to 210° F., the outside atmosphere being zero or 10° below zero. If, however, this high temperature is practicable, it is to be regretted that no case was shown where it occurs, and that no idea of the relative size and proportion of boiler and heating surface was given to attain such results. In the only practical experiment made by the author, and referred to on page 166, he states that the highest temperatures attained in two tests of the water entering coils were 195° and 206° F., while the outside air was 85° and 78°. Here was a case of one boiler sup-

plying 122 square feet of surface so that 210° might, if possible, be attained. It being the first literary contribution to hot-water heating in the United States, it is worthy of all the attention it will attract, and it is surely the precursor of many practical American additions to the library of hot-water heating literature.

THE LOCOMOTIVE.

We have received volume IX, covering the year 1888, of our valuable contemporary the *Locomotive*. We always look forward with interest to the advent of the monthly edition of our contemporary, and since the numbers are used extensively in abstracting we are always pleased to receive the bound volume at the end of the year, which we can keep in complete form for reference.

The Customs Department of the Dominion of Canada promulgated the following decisions in regard to duties on the 1st inst.: Lemon-squeezers, made wholly of glass, 20 per cent.; Paris white, dry, 20 per cent.; patent carbon enamel (composed of fusel-oil, &c.), \$1.90 per gallon; wire ferrules, iron, steel or brass, 30 per cent.

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CURRENT HARDWARE PRICES.

JUNE 19, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.—

Caps, Percussion, # 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	30¢
E. B. Trimmed Edge, 1-10's.....	25¢
E. B. Grnd. Fire, Cent. Fire.....	25¢
Double Waterproof, 1-10's.....	7½¢
Musket Waterproof, 1-10's.....	\$1.40
G. D.....	35¢
S. B.....	30¢

Union Metallic Cartridge Co.	
F. C. Trimmed.....	50¢
F. L. Ground.....	65¢
Cent. Fire Ground.....	25¢
Dbl. Waterproof.....	7½¢
Dbl. Waterproof, in 1-10's.....	\$1.40
S. B. Genuine Imp.orted.....	45¢
Eley's E. B.....	54¢
Eley's D Waterproof, Central Fire.....	\$1.60

Cartridges.	
Rim Fire Cartridges.....	50¢&52¢
Rim Fire Military.....	15¢&2¢
Cent. Fire, Pistol and Rifle.....	25¢&52¢
Cent. Fire, Military and Sporting.....	15¢&52¢

Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 22 cal., \$1.75.....	2¢
Blank Cartridges, 32 cal., \$3.50.....	2¢
Primed Shells and Bullets.....	15¢&52¢
B. B. Caps, Round Ball, \$1.75.....	2¢
B. B. Caps, Con. Ball, Swgd., \$2.00.....	2¢

Primers—	
Berdan Primers, \$1.00.....	2¢
B. L. Caps (for Sturtevant Shells) \$1.00.....	2¢
All other Primers, \$1.30.....	2¢

Shells—	
First quality, 4, 8, 10 and 12 gauge.....	25¢&10¢&2¢
First quality, 14, 16 and 20 gauge (\$10 list).....	30¢&10¢&2¢
Star, Club, Rival and Climax brands.....	20¢&10¢&2¢
Seibold's Comb. Shot Shells.....	15¢&2¢
Brass Shot Shells, 1st quality.....	60¢&2¢
Brass Shot Shells, Club, Rival, Climax.....	65¢&2¢
I X L, 10 and 12 gauge.....	40¢&52¢
"Special," 10 gauge.....	30¢&10¢&52¢
"Special," 10 and 12 gauge.....	40¢&10¢&2¢
Fowler's Pat.....	\$3.25

Shells Loaded—	
A. M. Co. List No. 19, 1887.....	40¢&10¢&10¢
Wads—	
U. M. C. & W. R. A.—B. E., 11 up.....	\$2.00
U. M. C. & W. R. A.—B. E., 10 up.....	\$2.30
U. M. C. & W. R. A.—B. E., 7&8.....	2.60
U. M. C. & W. R. A.—P. E., 11 up.....	3.10
U. M. C. & W. R. A.—P. E., 10 up.....	4.00
U. M. C. & W. R. A.—P. E., 7&8.....	4.00
Eley's B. E., 11 up.....	\$1.75
Eley's P. E., 11 up.....	2.80

Anvils.—	
Eagle Anvils, # 104.....	20¢&20¢&5¢
Peter Wright's.....	91¢
Armstrong's Mouse Hole.....	83¢
Armstrong's Mouse Hole, Extra.....	111¢
Trenton.....	94¢
Wilkinson's.....	94¢
J. & Riley Carr, Pat. Solid.....	116¢
Moore & Barnes Mfg. Co.....	33½¢

Anvil Vise and Drill—	
Millers Falls Co., \$18.00.....	20¢
Cheney Anvil and Vise.....	25¢
Allen Anvil and Vise, \$3.00.....	40¢&10¢

Apple Parers—	
Advance.....	¢ doz \$4.75
Antrim Combination.....	¢ doz 5.50
Baldwin.....	¢ doz 5.25
Champion.....	¢ doz 7.25
Eureka, 1888.....	each 17.00
Family Bay State.....	¢ doz 12.00
Gem.....	¢ doz 5.25
Gold Medal.....	¢ doz 4.00
Hudson's New '88.....	¢ doz 3.75
Ideal.....	¢ doz 4.75
Improved Bay State.....	¢ doz 30.00
Little Star.....	¢ doz 4.25
Monarch.....	¢ doz 13.50
New Lightning.....	¢ doz 5.25
Oriole.....	¢ doz 4.00
Penn.....	¢ doz 4.00
Perfection.....	¢ doz 4.00
Pomona.....	¢ doz 4.00
Rocking Table.....	¢ doz 5.50
Turntable.....	¢ doz 4.50
Victor.....	¢ doz 13.50
Waverly.....	¢ doz 4.50
White Mountain.....	¢ doz 4.50
72.....	¢ doz 4.25
76.....	¢ doz 5.75
78.....	¢ doz 6.50

Augers and Bits—	
Douglas Mfg. Co.....	
Wm. A. Ives & Co.....	
Humphreysville Mfg. Co.....	70%
French, Swift & Co. (F. H. Beecher, Rockford Bit Company).....	
Cook's, Douglas Mfg. Co.....	55%
Cook's, N. H. Copper Co. 50¢&10¢&50¢&10¢&5¢	
Ives' Circular Lip.....	90%
Patent Solid Head.....	30%
C. E. Jennings & Co., No. 10, extension lip.....	40%
C. E. Jennings & Co., No. 30.....	60%
C. E. Jennings & Co., Auger Bits, # set, 3½ quarter, No. 35, No. 30, \$3.50, 20%	
Lewis' Patent Single Twist.....	45%
Jennings' Augers and Bits.....	25%
Imitation Jennings' Bits.....	60¢&60¢&5¢
Pugh's Black.....	20%
Rockford, Jennings' Pattern.....	60%
Car Bits.....	50¢&10¢&50¢
L. Hommedieu Car Bits.....	15¢&10¢
Forstner Pat. Auger Bits.....	10%

Hollow Augers—

Ives'.....	33½¢
French, Swift & Co.....	33½¢&10¢
Douglas.....	40¢
Bonny's Adjustable, # doz \$4.50.....	40¢&10¢
Stearns'.....	30¢&10¢
Ives' Expansive, each \$4.50.....	50¢&5¢
Universal Expansive, each \$4.50.....	20%
Wood's.....	25¢&25¢&10¢

Expansive Bits—

Clarks' small, \$18; large, \$26.....	35¢&35¢&5¢
Ives' No. 4, # doz \$60.....	40%
Swan's.....	40%
Stearns' No. 1, #20; No. 2, #22.....	35%
Stearns' No. 2, #18.....	20%

Gimlet Bits—

Common.....	¢ gross \$2.75¢&3.25
Diamond.....	¢ doz \$1.10.....
Bee.....	25¢&25¢&5¢
Double Cut, Shephardson's.....	45¢&45¢&10¢
Double Cut, Ct. Valley Mfg. Co.....	30¢&10¢
Double Cut, Hartwell's, # gro.....	45¢&25
Double Cut, Douglas.....	40¢&10¢
Double Cut, Ives.....	60¢&60¢&10¢

Bit Stock Drills—

Morse Twist Drills.....	50¢&10¢&5¢
Standard.....	50¢&10¢&5¢
Cleveland.....	50¢&10¢&5¢
Syracuse, for metal.....	50¢&10¢
Syracuse, for wood (wood list).....	30¢&30¢&5¢
Williams' or Holt's, for metal.....	50¢&10¢&10¢
Williams' or Holt's, for wood.....	40¢&10¢

Ship Augers and Bits—

L'Hommedieu's.....	15¢&10¢&15¢&10¢&5¢
Watrous's.....	15¢&10¢&15¢&10¢&5¢
Snell's.....	15¢&10¢&15¢&10¢&5¢
Snell's Ship Auger Pat'n Car Bits.....	15¢&10¢&15¢&10¢&5¢

Awl Hafts—

Sewing, Brass Fer, # gr \$3.50.....	45¢&10¢
Pat. Sewing, Short, \$1.00.....	40¢&10¢
Pat. Sewing, Long.....	¢ doz \$1.20
Pat. Peg, Plain Top, # gr \$10.00.....	45¢&10¢
Pat. Peg, Leather Top, # gr \$12.00.....	45¢&10¢

Awls, Brad Sets, &c—

Awls, Sewing, Common # gr \$1.70, 35¢	
Awls, Should. Peg, # gr \$2.45, 40¢&40¢&10¢	
Awls, Pat. Peg.....	¢ gr 63¢.....
Awls, Shouldered Brad.....	2.70 # gr.....
Awls, Handled Brad.....	\$7.50 # gr.....
Awls, Handled Scratch # gr \$2.50, 35¢&10¢	
Awls, Socket Scratch, # doz, \$1.50, 25¢&30%	

Awl and Tool Sets—

Alken's Sets, Awls and Tools.....	
No. 20, # doz \$10.00.....	55¢&10¢
Pray's Ad. Tool Hds., Nos. 1, #12; 2, #18; 3, #12; 4, #20.....	25¢&25¢&10¢
Miller's Falls Ad. Tool Hds.....	
Nos. 1, #12, 2, #18.....	25%
Henry's Combination Haft.....	¢ doz \$6.50
Brad Sets.....	
No. 43, \$10.50; No. 43, \$12.50.....	70¢&10¢&5¢
Stanley's Excelsior.....	
No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50.....	30¢&10¢

Axes—

Makers' and Special Brands—	
First quality.....	¢ doz \$6.00¢&\$6.50
Others.....	¢ doz \$5.50¢&\$5.75

Axle Grease—

Fraser's.....	Keg # 1¢, Pail # 5¢
Fraser's, in boxes.....	¢ gr \$0.50
Dixon's Everlasting, in bxs.....	¢ doz 1¢
Dixon's Everlasting.....	\$1.20; 2 # 2.00
Lower grades, special brands.....	¢ gr \$5.50¢&\$7.00

Axles—

No. 1.....	4¢&4¢&4¢, No. 2 5¢&5¢&5¢
Nos. 7 to 14.....	55¢&5¢
Nos. 15 to 19.....	47½¢
Nos. 19 to 22.....	70%
National Tubular Self-Oiling Standard Farm (1 to 5) and Special Farm (A1 to A5).....	
Less than 10 sets.....	33½¢
Over 10 sets.....	39½¢&5¢

Bag Holders—

Sprengle's Pat.....	¢ doz \$18.....
60%	

Balances—

Spring Balances.....	50%
Common 24-in.....	¢ doz \$1.50.....
Chattillon's Spring Balances.....	50%
Chattillon's Circular Spring Balances.....	60%

Bells—

Hand—

Light Brass.....	70¢&10¢ @ 70%
White Metal.....	60¢&10¢&10¢
Silver Chime.....	33½¢&10¢
Globe (Cone's Patent).....	25¢&10¢&35%

Door—

Gong, Abbe's.....	33½¢&10¢
Gong, Yankee.....	45¢&10¢
Gong, Barton's.....	40¢&10¢&50%
Crank, Taylor's.....	25¢&10¢
Crank, Brooks'.....	50¢&10¢&2¢
Crank, Cone's.....	10%

Crank, Connel's.....	20¢&10¢
Lever, Sargent's.....	60¢&10¢
Lever, Taylor's Bronzed or Plated.....	net
Lever, Taylor's Japanned.....	25¢&10¢
Lever, R. E. M. Co.'s.....	50¢&10¢&2¢
Pull, Brook's.....	50¢&10¢&2¢
Pull, Western.....	25¢&10¢

Cone—

Common Wrought.....	60¢&10¢
Western.....	30¢&10¢
Western, Sargent's list.....	70¢&10¢
Kentucky, "Star".....	20¢&10¢
Kentucky, Sargent's list.....	70¢&10¢
Dodge, Genuine Kentucky.....	70¢&10¢
Texas Star.....	50¢&10¢&50¢&10¢&5¢
Call.....	40¢&40¢
Farm Bells.....	¢ doz \$3.4¢
Steel Alloy Church and School Bells.....	40%

Bellows—

Blacksmith's.....	50¢&10¢&5¢&60%
Molders'.....	40¢&10¢&10¢
Hand Bellows.....	40¢&10¢&50%

Belted, Rubber—

Common Standard.....	70¢&10¢
Standard.....	70¢&10¢
Extra.....	60¢&5¢&60¢&10¢
N. Y. B. & P. Co., Carbon.....	60¢&10¢&5¢
N. Y. B. & P. Co., Diamond.....	50¢&10¢

Bench Stops—

Morrill's.....	¢ doz \$9, 50%
Hotchkiss's.....	¢ doz \$5, 10¢&10¢&10%
Weston's, No. 1, \$10; No. 2, \$9.....	25¢&10¢&5¢
McGill's.....	¢ doz \$3.....

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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Bit Holders—

Extension.....	
Barber's, # doz \$15.00.....	40¢&40¢&10%
Ives, # doz \$20.00.....	60¢&5¢&60¢&10%
Diagonal.....	¢ doz \$24.00, 40%
Angular.....	¢ doz \$24.00, 40¢&5¢

Blind Adjusters—

Domestic.....	¢ doz \$3.00, 33½%
Excelsior.....	¢ doz \$10.00.....
Washburn's Self-Locking.....	30¢&20¢&10%

Blind Fasteners—

MacKrell's, # doz, \$1.00.....	20¢&20¢&10%
Van Sand's Screw Pat., \$15 # gr.....	60¢&10%
Van Sand's Old Pat., \$15.00 # gr.....	55¢&10%
Washburn's Old Pattern, # gr.....	\$9.00
Merriman's New list.....	\$9.00
Austin & Eddy No. 2008, # gr.....	\$9.00
Security Gravity, # gr.....	\$9.00

Blind Staples—

Barbed, ½ in. and larger.....	¢ doz 7½¢&8¢
Barbed, ¾ in.....	¢ doz 8½¢&9¢

Blocks—

Ordinary Tackle, list May 20, 1889.....	40¢&10¢&50%
Cleveland Block Co., Mal. Iron.....	50%
Moore's Novelty, Mal. Iron.....	50%

Bolts—

Door and Shutter—	
Cast Iron Barrel, Square, &c.....	70¢&70¢&10%
Cast Iron Shutter Bolts.....	70¢&70¢&10%
Cast Iron Chain (Sargent's list).....	65¢&10%
Ives' Patent Door Bolts.....	60%
Wrought Barrel.....	70¢&70¢&10%
Wrought Square.....	70¢&70¢&10%
Wrt Shutter, all Iron, Stanley's.....	60¢&10%
Wrt Shutter, Brass Knob.....	40¢&10%
Wrt Shutter, Sargent's list.....	60¢&10%
Wrt Sunk Flush, Sargent's list.....	55¢&10%
Wrt Sunk Flush, Stanley's list.....	50¢&10%
Wrt B.K. Flush, Com'n.....	55¢&10%

Carriage, Machine, &c.—

Com. list June 10, '84.....	75¢&10¢&2¢
Genuine Eagle, list Oct., '84.....	75¢&10%
Phila. pattern, list Oct. 7, '84.....	75¢&10%
R. B. & W., old list.....	75¢&10¢&5¢
Machine, according to size.....	70%
Bolt Ends, according to size.....	75¢&10¢&80%

Tire—

Common, list Feb. 28, '83.....	70%
Port Chester Bolt and Nut Company.....	
Empire, list Feb. 28, '83.....	70%
Phila., list Oct. '84.....	82½%
Keystone, Philadel., list Oct. '84.....	82½%
Norway, Phila., list Oct. '84.....	75¢&10%
American Screw Company.....	
Norway, Phila., list Oct. 16, '84.....	75¢&10%
Eagle, Phila., list Oct. 16, '84.....	80%
Philadel., list Oct. 16, '84.....	82½%
Bay State, list Feb. 28, '83.....	70%
R. B. & W., Philadel., list Oct. 16, '84.....	82½%

Stove and Flow—

Stove.....	65%
Flow.....	60¢&5¢
R. B. & W., Flow.....	55%

Cards—
Horse & Curry.....10¢10¢10¢10¢
Cotton.....10¢10¢10¢
Wool.....10¢10¢10¢

Carpet Stretchers—
Cast Steel, Polished.....\$ doz \$2.25
Cast Iron, Steel Points.....\$ doz \$2.00
Socket.....\$ doz \$1.75
Bullard's.....25¢25¢10¢

Carpet Sweepers—
Bissell No. 5.....\$ doz \$17.00
Bissell No. 7 New Drop Pan.....\$ doz \$19.00
Bissell, Grand.....\$ doz \$36.00
Grand Rapids.....\$ doz \$24.00
Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00
Jewel.....\$ doz \$17.00

Magie—
Improved Parlor Queen.....\$ doz \$27.00
Nickel.....\$ doz \$27.00
Japanned.....\$ doz \$24.00
Excelsior.....\$ doz \$22.00
Garland.....\$ doz \$18.00
Parlor Queen.....\$ doz \$18.00
Housewife's Delight.....\$ doz \$15.00
Queen.....\$ doz \$16.00
Queen, with band.....\$ doz \$18.00
King.....\$ doz \$20.00
Weed, Improved.....\$ doz \$18.00
Hub.....\$ doz \$18.00
Cog Wheel.....\$ doz \$18.00
Conqueror.....\$ doz \$22.00
Easy.....\$ doz \$22.00
Monarch.....\$ doz \$22.00
Goshen.....\$ doz \$22.00
Advance.....\$ doz \$22.00
Ladies' Friend, No. 1, \$15.00; No. 2, \$16.00
American.....\$ doz \$15.00
Grand Republic.....\$ doz \$35.00

Cartridges—
See Ammunition.

Casters—
Bed.....\$ Brass.....55¢55¢10¢
Shallow Socket.....\$ Others.....60¢60¢10¢
Deep Socket.....\$ 40¢10¢
Yale Casters, list May, 1888.....\$ 30¢10¢40¢
Yale, Gem.....\$ 60¢60¢5¢
Martin's Patent (Phoenix).....\$ 45¢10¢50¢
Payson's Anti-friction.....\$ 60¢60¢10¢
Giant Truck Casters.....\$ 30¢10¢
Stationary Truck Casters.....\$ 30¢10¢
Socket Truck Casters.....\$ 50¢

Cattle Leaders—
Humason, Beckley & Co.'s.....70¢
Sargent's.....60¢8¢10¢
Hotchkiss.....30¢
Peck, Stow & W. Co.....50¢10¢

Chain—
Trace, 6-10-2, exact.....\$ pair \$1.03.....50¢10¢50¢10¢5¢
Trace, 6-10-3, exact.....\$ pair \$2.00.....50¢10¢50¢10¢5¢
Trace, 7-10-2, exact.....\$ pair \$1.11.....50¢10¢50¢10¢5¢
NOTE.—Traces, "Regular" sizes, 3¢ net
Log, Fifth, Stretcher, and other fancy
Chains, list Nov. 1, 1888.....50¢10¢50¢10¢5¢

American Coll. in cask lots,
3-16 1/2 5-16 3/4 7-16 1/2 8 1/2 9 1/2
\$8.75 6.25 5.00 4.50 4.40 4.00 3.75 3.50
Less than cask lots, add 1/4¢ per lb.
German Coll. list of June 20, 1887.....60¢10¢50¢10¢5¢

German Halter Chain, list of June 20, 1887.....50¢10¢50¢10¢5¢
Covert Halter, Hitching and Breast.....50¢2¢
Covert Traces.....35¢2¢
Onaida Halter Chain.....60¢60¢5¢
Galvanized Pump Chain.....\$ 75¢60¢40¢
Jack Chain, Iron.....75¢75¢5¢
Jack Chain, Brass.....70¢70¢5¢

Chalk—
White.....\$ gr 50¢
Red.....\$ gr 70¢
Blue.....\$ gr 85¢
See also Crayons.

Chalk Lines—
See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W.....75¢10¢ (75¢
New Haven.....10¢5¢
Wetherby.....75¢75¢5¢
Ohio Tool Co.....75¢75¢5¢
Buck Bros.....30¢
Merrill.....60¢10¢60¢10¢5¢
L. & J. White.....30¢30¢5¢

Tanged and Miscellaneous.
Tanged Firmer.....40¢10¢50¢
Butcher's.....\$4.75¢85.00
Spear & Jackson's.....\$5 to 2
Buck Bros.....30¢
Cold Chisels, \$ m.....16¢10¢

Chucks—
Beach Pat.....each \$8.00.....20¢
Morse's Adjustable, each, \$7.00, 20¢20¢5¢
Danbury.....each \$6.00, 30¢30¢5¢
Syracuse, Balz Pat.....25¢
Skinner's Pat. Drill Chucks.....30¢
Skinner's Independent Lathe Chucks.....40¢
Skinner's Pat. Comb. Chuck.....40¢

Clamps—
R. I. Tool Co.'s Wrought Iron.....25¢
Adjustable, Gray's.....30¢
Adjustable, Lambert's.....30¢
Adjustable, Snow's.....40¢5¢
Adjustable, Hammers.....15¢
Adjustable, Stearns.....20¢10¢
Stearns's Adjustable Cabinet and Corner.....20¢10¢
Cabinet, Sargent's.....60¢8¢10¢
Carriage Makers' Sargent's.....70¢10¢
Eberhard Mfg. Co.....40¢5¢40¢10¢
Warner's.....40¢10¢40¢10¢5¢
Saw Clamps, see Vises

Clips—
Norway, Axle, 1/2 in 5-16.....55¢5¢5¢
2nd grade Norway Axle, 1/2 in 5-16, 65¢5¢
Superior Axle Clip.....60¢5¢60¢4¢5¢
Norway Spring Bar Clips, 5-16, 60¢5¢5¢
Wrought Iron Felloe Clips.....\$ m, 5¢
Steel Felloe Clips.....\$ m, 5¢
Baker Axle Clips.....25¢

Cockeyes—.....50¢

Cocks, Brass.
Hardware list.....40¢10¢2¢

Coffee Mills—
Box and Side, list Jan. 1, 1888.....50¢2¢
American, Enterprise Mfg Co. 20¢10¢30¢
The Swift, Lane Bros.....20¢10¢

Compasses Dividers, &c—
Compasses, Callipers, Dividers, 70¢70¢10¢
Bemis & Call Co.'s.....60¢5¢
Dividers.....60¢5¢
Compasses & Callipers.....50¢5¢
Wing and Inside or Outside.....60¢
Double.....60¢
Call's Pat. Inside.....30¢
Excelsior.....50¢
J. Stevens & Co.'s.....25¢10¢
Starrett's.....25¢10¢
Spring Callipers and Dividers 25¢10¢10¢
Lock Callipers and Dividers.....25¢10¢
Combination Dividers.....25¢10¢

Coopers' Tools—
Bradley's.....20¢
Barton's.....20¢20¢5¢
L. & J. White.....20¢5¢
Albertson Mfg. Co.....25¢
Beatty's.....30¢
Sandusky Tool Co.....30¢30¢5¢

Corkscrews—
Humason & Beckley Mfg. Co. 40¢40¢10¢
Clough's Pat.....30¢30¢35¢
Howe Bros & Hulbert.....35¢

Corc. Knives and Cutters—
Bradley's.....10¢
Wadsworth's.....25¢

Cradles—
Grain.....50¢2¢

Crayons.
White Crayons, \$ gr 12¢12¢4¢.....10¢
D. M. Stewart Mfg. Co., Metal Work-ers, \$ gr, \$2.50.....25¢
J. M. Stewart Mfg. Co., Rolling Mill, \$ gr, \$2.50.....25¢
See also Chalk.

Crow Bars—
Cast Steel.....\$ m 4¢
Iron, Steel Points.....\$ m 3¢

Curry Combs—
Fitch's.....50¢10¢50¢10¢10¢
Rubberper doz \$10.00.....20¢
Perfect.....50¢

Curtain Pins—
Silvered Glass.....net
White Enamel.....net

Cutlery—
Weaver Falls & Booth's.....33¢
Wostenholme.....\$7.75 to 2

Dampers, &c—
Dampers, Buffalo.....40¢10¢
Buffalo Damper Clips.....40¢10¢
Crown Damper.....40¢
Excelsior.....40¢10¢

Dividers—
See Compasses.

Dog Collars—
Embossed, Gilt, Pope & Steven's list.....30¢10¢
Leather, Pope & Steven's list.....40¢
Brass, Pope & Steven's list.....40¢

Door Springs—
Torrey's Rod, regular size.....\$ doz \$1.30
Gray's, \$ gr, \$20.00.....20¢
Bee Rod, \$ gr, \$20.00.....20¢
Warner's No. 1, \$ doz, \$2.50; No. 2, \$3.30.....40¢10¢50¢
Gem (Coll), list April 19, 1886.....10¢
Star (Coll), list April 19, 1886.....20¢
Victor (Coll).....60¢60¢10¢
Champion (Coll).....60¢10¢60¢10¢
Philadelphia, 5 in., \$5.00; 8 in., \$7.75.....\$
Cowell's.....No. 1, \$ doz, \$18.00; No. 2, \$15.00.....50¢
Rubber, complete, \$ doz, \$4.50.....55¢10¢
Hercules.....25¢
Shaw Door Check and Spring.....25¢30¢5¢

Drawing Knives—
Wetherby.....75¢10¢ (75¢10¢
P. S. & W.....5¢
New Haven.....60¢10¢60¢10¢5¢
Merrill.....75¢75¢5¢
Watrous.....15¢10¢25¢
L. & J. White.....20¢5¢
Bradley's.....35¢
Adjustable Handle.....25¢25¢5¢
Wilkinson's Folding.....25¢25¢5¢

Drills and Drill Stocks—
Blacksmith's.....each \$1.75
Blacksmith's Self-Feeding, each \$7.50, 20¢
Breast, P. S. & W.....40¢10¢
Breast, Wilson's.....30¢5¢
Breast, Millers Falls, each \$2.00, 25¢
Breast, Bartholomew's.....each \$2.50, 25¢10¢40¢
Ratchet, Merrill's.....20¢20¢5¢
Ratchet, Ingersoll's.....25¢
Ratchet, Parker's.....30¢20¢10¢
Ratchet, Whitney's.....20¢10¢
Ratchet, Weston's.....20¢25¢
Ratchet, Moore's Triple Action.....25¢30¢
Whitney's Hand Drill, Plain, \$11.00.....20¢10¢
Wilson's Drill Stocks.....10¢
Automatic Boring Tools.....\$1.75¢11.85

Twist Drills—
Morse.....50¢10¢5¢
Standard.....50¢10¢5¢
Syracuse.....50¢10¢
Cleveland.....50¢10¢5¢
Williams.....50¢10¢5¢
New Process.....50¢10¢5¢

Drill Bits—See Augers and Bits.

Drill Chucks—See Chucks.

Dripping Pans—
Small sizes.....\$ m 6¢4¢
Large sizes.....\$ m 6¢4¢

Egg Beaters.
Dover.....\$ doz \$1.50
National, \$ doz \$4.50.....33¢4¢
Family (T. & S. Mfg. Co.), \$ gro \$17.00¢
\$18.00

Duplex (Standard Co.).....\$ gro \$15.00
Rival (Standard Co.).....\$ gro \$12.00
Large Duplex (Standard Co.), \$ doz \$4.50
Triumph (T. & S. Mfg. Co.), \$ gro \$10.50
@ \$11.50
Advance, No. 1.....\$ gro \$10.50
Advance, No. 2.....\$ gro \$10.00
Ayres' Spiral.....\$ gro \$15.00
Double (H. & R. Mfg. Co.).....\$ gro \$16.20
Easy (H. & R. Mfg. Co.).....\$ gro \$14.00
Triple (H. & R. Mfg. Co.).....\$ gro \$16.20
Spiral (H. & R. Mfg. Co.).....\$ gro \$4.50
Paine, Diehl & Co.'s.....\$ gro \$24.00

Egg Poachers—
Buffalo Steam Egg Poachers, \$ doz, No. 1, \$6.00; No. 2, \$9.00.....25¢
Electric Bell Sets—
Wollensak's.....20¢
Bigelow & Dowse.....20¢

Emery— No. 4 to No. 54 to Flour, CF
46 gr. 150 gr. F F F.
Kegs, \$ m 4¢4¢ 5¢ 2¢4¢
1/2 kegs, \$ m 4¢4¢ 5¢ 2¢4¢
1/4 kegs, \$ m 5¢ 5¢4¢ 3¢
10 lb cans, 10¢
In case.....6¢ 6¢4¢ 5¢
10 means, less than 10.....10¢ 10¢ 7¢4¢

Enamelled and Tinned Ware—
See Hollow Ware.

Escatcheon Pins—
Iron, list Nov. 11, 1885.....60¢10¢50¢10¢5¢
Brass.....60¢60¢5¢

Escatcheons.
Door Lock.....Same dis as Door Locks.
Brass Thread.....60¢60¢10¢
Wood.....25¢

Faucets—
Fenn's.....40¢
Bohren's Pat. Rubber Ball.....25¢
Fenn's Cork Stops.....33¢4¢
Star.....60¢
Frary's Pat. Petroleum.....40¢5¢2¢
B. & L. P. Co.

West's Lock, Open and Shut Key.....50¢
Star, Metal Plug, new list.....40¢
Lockport, Metal Plug, reduced list, 60¢
Metallic Key, Leather Lined.....60¢10¢
60¢10¢10¢

Cork Lined—
Burnside's.....70¢5¢70¢10¢
Burnside's Red Cedar, bbl lots.....50¢10¢
John Sommers' Peerless Best Block Tin Key.....40¢
LXL, list quality, Cork Lined.....50¢
Diamond Lock.....40¢
Perfection, Fla. Red Cedar.....50¢
Goodenough Cedar.....50¢
Boss Metallic Key.....50¢
Reliable Cork Lined.....60¢
Western Pattern Cork Lined.....50¢

Self-Measuring—
Enterprise, \$ doz \$50.00.....20¢10¢
Lane's, \$ doz \$30.00.....25¢10¢
Victor, \$ doz \$30.00.....25¢10¢

Felloe Plates—
\$ m 6¢6¢4¢
Fifth Wheels—
Derby and Cincinnati.....45¢5¢

Files—
Domestic—
Nicholson Files, Rasps, &c.....60¢10¢60¢10¢5¢
Nicholson (X. F.) Files.....25¢
Nicholson's Royal Files (Seconds).....75¢
(extra prices on certain sizes)
Other makers, best brands.....60¢10¢60¢10¢10¢
Fair brands.....60¢10¢60¢10¢70¢
Second quality.....70¢10¢75¢10¢
Nicholson's Horse Rasps.....60¢10¢60¢
Heller's Horse Rasps.....50¢7¢50¢10¢
McCauley's Horse Rasps.....60¢10¢
Chelsea Horse Rasps, Hand Cut.....50¢10¢

Imported—
J. & Riley Carr.....List, April 1, 1883, 15¢
J. & Riley Carr Horse Rasps.....10¢
Moss & Gamble.....List, April 1, 1883, 15¢
Butcher.....Butcher's list, 20¢
Stubs list, 25¢30¢
Turton's.....Turton's list, 20¢25¢
Greaves' Horse Rasps, American list, 60¢

Fluting Machines—
Knox, 4 1/2 inch Rolls.....\$3.25 each
Knox, 6 inch Rolls.....\$3.00 each
Eagle, 3 1/2 inch Roll, \$2.15.....35¢
Eagle, 5 1/2 inch Roll, \$2.85.....35¢
Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in., \$6.50 each
Crown, 6 in., \$3.50; 6 in., \$3.40; 7 in., \$4.50 each.....35¢
Domestic Fluter.....each \$1.50
Geneva Hand Fluter, White Metal.....\$ doz \$12.25
Crown Hand Fluter, No. 1, \$15.00; 2, \$12.50; 3, \$10.00.....30¢
Shepard Hand Fluter, No. 85 \$ doz \$15.30.....40¢
Shepard Hand Fluter, No. 110 \$ doz \$11.00.....40¢
Shepard Hand Fluter, No. 95 \$ doz \$8.00.....40¢
Clark's Hand Fluter, \$ doz \$15.00.....35¢
Combined Fluter and Sad Iron, \$ doz \$15.00.....30¢
Buffalo.....\$ doz \$10.00.....10¢

Fluting Scissors—.....45¢
Fodder Squeezers—
Blair's.....\$ doz \$2.00
Blair's "Climax".....\$ doz \$1.25

Forks—
Hay, Manure, &c., Asso. List.....65¢
Hay, Manure, &c., Phila. List 60¢60¢5¢
Plated, see Spoons.

Freezers, Ice Cream—

Buffalo Champion.....60¢10¢5¢
Shepard's Lightning.....65¢65¢5¢
White Mountain.....50¢20¢5¢
New Arctic.....50¢40¢5¢
American.....60¢
Gem.....65¢
Blizzard.....70¢
Double Action Crown.....60¢
Crown.....60¢
Star.....60¢
Peerless and Giant.....60¢10¢
Zero and Pet.....65¢10¢
Boss.....65¢10¢10¢

Fruit and Jelly Presses—
Enterprise Mfg. Co.....20¢10¢30¢
Hens.....\$ doz \$2.50
Shepard's Queen City.....40¢

Fry Pans—
High List.....75¢5¢75¢10¢
No.....0 1 2 3 4
\$ doz.....\$3.75 \$4.70 \$5.30 \$5.95 \$6.55
No.....5 6 7 8
\$ doz.....\$7.50 \$8.75 \$10.00 \$11.25
Low List.....65¢10¢
No.....0 1 2 3 4
\$ doz.....\$3.00 \$3.75 \$4.25 \$4.75 \$5.25
No.....5 6 7 8
\$ doz.....\$6.00 \$7.00 \$8.00 \$9.00

Fuse— \$ 1000 ft
Common Hemp Fuse, for dry ground, \$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground 4.25
Double Taped Fuse, for very wet gr. 5.40
Triple Taped Fuse, for very wet gr. 6.50
Small Gutta Percha Fuse, for water, 7.50
Large Gutta Percha Fuse, for water, 12.00

Gauges—
Marking, Mortise, &c.....60¢10¢
Starrett's Surface, Center and Scratch.....25¢10¢
Wire, low list.....10¢10¢
Wire, Wheeler, Madden & Co.....10¢
Wire, Morse's.....50¢50¢5¢
Wire, Brown & Sharpe's.....10¢20¢

Gimlets—
Nail and Spike.....50¢10¢5¢
"Eureka" Gimlets.....40¢10¢
"Diamond" Gimlets.....\$ gr \$5.00
Double Cut, Shepardson's.....45¢45¢5¢
Double Cut, Ives.....60¢60¢5¢
Double Cut, Douglass.....40¢10¢
"Bee," \$ gr \$12.....25¢25¢5¢

Glue—
Le Page's Liquid.....25¢25¢5¢
Upton's Liquid.....35¢
Le Page & Co.'s Improved Process.....25¢25¢5¢

Glue Pots—
Tinned.....40¢
Enamelled.....40¢5¢
Family, Howe's "Eureka".....40¢
Family, L. F. C.'s "Handy".....50¢

Grindstones—
Small, at factory.....\$ ton \$7.50¢9.00

Grindstone Fixtures—
Sargent's Patent.....70¢10¢
Reading Hardware Co.....80¢10¢

Hack Saws—
See Saws.

Halters—
Covert's, Rope, 1/2 in. Jute.....50¢2¢
Covert's, Rope, 1/2 in. Hemp.....40¢2¢
Covert's Adj. Rope Halters.....40¢2¢
Covert's Hemp Horse and Cattle Tie, 50¢2¢
Covert's Jute Horse and Cattle Tie, 60¢10¢2¢

Hammers—
Handled Hammers—
Maydole's, list Dec. 1, '85.....25¢10¢35¢
Buffalo Hammer Co.....List Jan. 15, '87
Humason & Beckley.....50¢50¢10¢
Atha Tool Co.....40¢10¢50¢
Fayette R. Plumb.....40¢10¢50¢
C. Hammond & Son.....40¢10¢50¢
Verres.....1/2 in. \$ 1.25, 1.50 & 1.75.....30¢10¢
Nelson Tool Works.....40¢10¢
Warner & Nobles.....20¢25¢
Peck, Stow & Wilcox.....40¢
Sargent's.....35¢10¢
Heavy Hammer and Sledge—
3 lb and under.....\$ 40¢ 60¢10¢
3 to 5 lb.....\$ 30¢ 40¢ 60¢10¢
Over 5 lb.....\$ 30¢ 40¢ 60¢10¢
Wilkinson's Smiths.....10¢4¢11¢4¢

Handcuffs and Leg Irons—
R. I. Tool Co., Handcuffs, \$15.00 \$ doz 104
R. I. Tool Co., Leg Irons, \$25.00 \$ doz 105
Tower's.....25¢
Daley's Improved Handcuffs: 2 Hands, Polished, \$ doz \$48.00; Nickeled, \$57.00; 3 Hands, Polished, \$ doz \$72.00; Nickeled, \$84.00.....25¢

Handles—
Iron, Wrought or Cast—
Door or Thumb.....0 1 2 3 4
Per doz.....\$0.90 \$1.00 \$1.18 \$1.35 \$1.50
Roggin's Latches.....\$ doz \$30¢35¢
Bronze Iron Drop Latches.....\$ doz 70¢ net
Jap'd Store Door Handles—Nuts, \$1.62; Plate, \$1.10; no Plate, \$0.88.....net
Barn Door, \$ doz \$1.40.....10¢10¢
Chest and Lifting.....70¢

Handles, Wood—
Saw and Plane.....40¢10¢40¢10¢5¢
Hammer, Hatchet, Axe, Sledge, &c.....40¢
Brad Awl.....\$ gr \$2.00
Hickory Firmer Chisel, ass'd, \$ gr 4.50
Hickory Firmer Chisel, large, \$ gr 5.00
Apple Firmer Chisel, ass'd, \$ gr 5.00
Apple Firmer Chisel, large, \$ gr 6.00
Socket Firmer Chisel, ass'd, \$ gr 5.00
Socket Framing Chisel, ass'd, \$ gr 5.00
J. S. Smith & Co.'s Pat File.....50¢
File, assorted.....\$ gr 2.75 40¢
Auger, assorted.....\$ gr 5.00 40¢
Auger, large.....\$ gr 7.00 40¢10¢
Pat. Auger, Ives.....30¢10¢
Pat. Auger, Douglass.....\$ set \$1.25
Pat. Auger, Swan.....\$ set \$1.00
Hoe Rake Shovels &c.....50¢10¢

Cross-Cut Saw Handles—
 Atkins' No. 1 Loop, pair, 28¢; No. 3, 18¢; No. 6, 10¢; No. 2 and No. 4 Reversible, 18¢.
 Boynton's Loop Saw Handles, 50¢... 60¢
 Champion.....15¢

Hangers—

Barn Door, old patterns.....60¢10¢10¢70¢
 Barn Door, New England.....60¢10¢10¢70¢
 Samson Steel Anti-Friction.....55¢
 Orleans Steel.....55¢
 Hamilton Wrought Wood Track.....55¢
 U. S. Wood Track.....35¢
 Champion.....60¢10¢
 Rider and Wooster, Medina Mfg. Co.'s list.....70¢
 Climax Anti-Friction.....60¢
 Umax Anti-Friction Wood Track.....55¢
 Zenith for Wood Track.....55¢
 ed's Steel Arm.....50¢
 Challenger, Barn Door.....50¢
 Sterling's Imp'vd (Anti-Friction).....65¢10¢
 Terry's Pat., ½ doz pr. 4 in., 10.00; 5 in., 12.00.....50¢10¢
 Cronk's Pat., No. 4, 12.00; No. 5, 14.40; No. 6, 18.00.....60¢15¢60¢
 Wood Track Iron Clad, ½ ft. 10¢.....60¢

Carrier Steel Anti-Friction.....50¢50¢50¢
 Architect, ½ set 6.00.....20¢
 Eclipse.....20¢10¢
 Felix, ½ set 4.50.....20¢
 Richards.....30¢30¢10¢
 Lane's Steel Anti-Friction.....50¢
 Ball Bearing Door Hanger.....20¢10¢25¢10¢
 Warner's Pat.....20¢30¢10¢
 Stearns' Anti-Friction.....20¢30¢10¢
 Stearns' Challenge.....25¢10¢25¢10¢10¢
 Faultless.....40¢40¢55¢
 American, ½ set 8.00.....20¢10¢
 Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40¢
 Paragon, Nos. 1, 2 and 3.....40¢10¢
 Paragon, Nos. 5, 6, 7 and 8.....20¢10¢
 Crescent.....60¢60¢10¢
 Nickel Cast Iron.....50¢
 Nickel Malleable Iron and Steel.....50¢
 Scranton Anti-Friction Single Strap.....35¢
 Scranton Anti-Friction Double Strap.....40¢
 Universal Anti-Friction.....40¢
 Wild West, 4 in. Wheel, 15.00; 5 in., 12.00.....45¢
 Star.....40¢10¢50¢50¢
 May.....50¢50¢50¢10¢
 Barry, 60.00.....40¢10¢

Harness Snaps—
 See Snaps.

Hatchets—

List Jan. 1, 1888.
 Isaiah Blood.....35¢40¢
 Hunt's Shingling, Lath and Claw.....40¢55¢
 Hunt's Broad.....40¢
 Buffalo Hammer Co.....40¢10¢50¢
 Hurd's.....40¢10¢50¢
 Fayette R. Plumb.....40¢10¢50¢
 Wm. Mann, Jr.....50¢50¢50¢
 Underhill Edge Tool Co.....40¢50¢10¢
 Underhill's, Haines and Bright.....35¢
 C. Hammond & Son.....40¢10¢50¢
 Simmonds.....40¢10¢50¢
 Peck's.....40¢10¢50¢
 Kelly's.....50¢50¢50¢
 Sargent & Co.....50¢
 Ten Eyck Edge Tool Co.....40¢10¢40¢10¢50¢
 Collins.....10¢
 Schulte, Lohoff & Co.....50¢50¢50¢

Hay and Straw Knives—
 Lightning, Mfrs. price ½ doz 18.00, 25¢
 But jobbers frequently give extras.
 Gem.....40¢75¢40¢10¢
 Wadsworth's.....40¢75¢40¢10¢
 Carter's Needle.....½ doz 11.50; 40¢12.00
 Heath's.....½ doz 13.50; 40¢14.00
 Auburn Hay, Com. and Spear Point.....50¢
 Auburn, Straw.....50¢
 Nolin's Hay.....½ doz 10.00

Hinges—
 Wrought Iron Hinges
 Strap and T.....75¢55¢75¢10¢
 Screw Hook and Strap.....6 to 12 in., ½ doz.....35¢
 14 to 20 in., ½ doz.....34¢
 22 to 36 in., ½ doz.....28¢
 Heavy Welded Hook.....6 to 12 in., ½ doz.....34¢
 14 to 20 in., ½ doz.....34¢
 22 to 36 in., ½ doz.....28¢
 Screw Hook and Eye.....½ in., ½ doz 1.50; 10¢
 and Eye.....¾ in., ½ doz 3.80; 10¢
 Rolled Blind Hinges, Nos. 22 and 24.....50¢10¢
 Rolled Blind Hinges, Nos. 22 and 24.....55¢10¢
 Rolled Plate.....70¢10¢
 Rolled Raised.....70¢10¢
 Plate Hinges 8, 10 and 12 in., ½ doz.....55¢
 "Providence" over 12 in., ½ doz.....45¢

Spring Hinges—
 Geer's Spring and Blank Butts.....40¢
 Union Spring Hinge Co.'s list, March, 1886.....20¢
 Acme.....30¢
 U. S.....30¢
 Empire and Crown.....20¢
 Hero and Monarch.....55¢
 American, Gem, and Star.....20¢
 Oxford.....20¢
 Barker's Double Acting.....20¢10¢
 Union Mfg. Co.....25¢
 Bommer's.....30¢
 Buckman's.....15¢20¢
 Chicago.....30¢
 Wiles.....10¢
 Devore's.....40¢
 Rex.....40¢
 Royal.....60¢
 Reliable.....60¢
 Champion.....60¢

Gate Hinges—
 Western.....½ doz 44.00, 60¢
 N. E.....½ doz 7.00, 50¢
 N. E. Reversible.....½ doz 55.20, 55¢10¢
 Clark's, Nos. 1, 2, 3.....60¢10¢50¢
 N. Y. State.....½ doz 55.00, 55¢10¢
 Automatic.....½ doz 12.50, 50¢
 Common Sense.....½ doz pair 4.50, 50¢
 Seymour's.....45¢10¢
 Shepard's.....10¢10¢50¢
 Reed's Latch and Hinges.....½ doz 12.00, 50¢

Blind Hinges—
 Parker.....75¢25¢
 Palmer.....50¢50¢10¢
 Seymour.....70¢25¢
 Nicholson.....45¢10¢
 Hufer.....50¢

Clark's, Nos. 1, 3, 5, 40 and 50.....75¢10¢50¢80¢
 Clark's Mortise Gravity.....75¢10¢50¢80¢
 Sargent's, Nos. 1, 3, 5, 11, 13.....75¢10¢50¢10¢50¢
 Sargent's, No. 12.....77¢10¢10¢
 Reading's Gravity.....75¢10¢10¢50¢
 Shepard's.....75¢10¢50¢
 Noiseless.....75¢10¢50¢
 Niagara.....80¢25¢
 Buffalo.....80¢50¢
 Clark's Genuine Pat.....80¢50¢
 O. S. Lull & Porter.....75¢10¢80¢
 Acme, Lull & Porter.....75¢50¢
 Queen City Reversible.....75¢50¢
 Clark's Lull & Porter, Nos. 9, 1, 1½, 2, 2½, 3.....75¢10¢2½¢
 North's Automatic Blind Pictures, No. 2, for Wood, 10.50; No. 3, for Brick, 13.50.....25¢25¢

Hoes—

Handled—
 Garden, Mortar, &c.....65¢
 Plaster's Cotton, &c.....65¢
 Warren Hoe.....60¢
 Magic.....½ doz 4.00

Eye—

D. & H. Scovill.....20¢
 Lane's Crescent Planters Pattern.....45¢55¢
 Lane's Razor Blade, Scovill Pattern.....30¢
 Maynard, S. & O. Pat.....45¢55¢
 Sandusky Tool Co., S. & O. Pat.....60¢
 Hubbard & Co., S. & O. Pat.....60¢
 Chattanooga Tool Co., S. & O. Pat.....60¢
 Grub.....60¢60¢10¢

Hog Rings and Ringers—
 Hill's Improved Ringers.....½ doz 24.25
 Hill's Old Style Ringers.....½ doz 22.75
 Hill's Tongs.....½ doz 24.50
 Hill's Rings.....½ doz 25.15; 22.25
 Perfect Ringers.....½ doz 21.00; 1.70
 Perfect Ringers.....½ doz 22.15; 22.25
 Blair's Hog Ringers.....½ doz 22.25; 22.50
 Blair's Hog Ringers.....½ doz 20.00; 1.00
 Champion Ringers.....½ doz 22.00
 Champion Ringers, Double.....½ doz 22.25
 Brown's Ringers.....½ doz 22.00
 Brown's Ringers.....½ doz 12.25; 1.30

Holisting Apparatus—
 Moore's Hand Holist, with Lock.....20¢
 Brake, Britannia Co.....40¢
 Moore's Differential Pulley Block.....40¢
 Energy Mfg. Co.'s.....25¢

Holders, File and Tool—
 Balz Pat.....½ doz 4.00; 20¢
 Nicholson File Holders.....25¢

Hollow-Ware—
 Iron—
 Stove Hollow-Ware—
 Ground.....60¢60¢55¢
 Unground.....60¢10¢60¢10¢10¢
 Boilers and Saucepans.....40¢55¢
 Tinned Boilers and Saucepans.....40¢
 Gray Enamelled-Ware—
 Stove.....45¢50¢
 Maslin Kettles.....60¢10¢60¢10¢10¢
 Boilers and Saucepans.....40¢55¢
 Agate and Granite Ware, list Jan. 1, 1889.....33¢10¢10¢
 Rustless Hollow-Ware.....50¢50¢50¢
 Galvanized Tea-Kettles—
 Inch.....6 7 8 9 5
 Each.....55¢ 60¢ 65¢ 75¢

Silver Plated—
 4 mo. or 5 cash in 30 days.
 Reed & Barton.....40¢55¢
 Meriden Britannia Co.....40¢55¢
 Simpson, Hall, Miller & Co.....40¢55¢
 Rogers & Brother.....40¢55¢
 Hartford Silver Plate Co.....40¢55¢
 William Rogers Mfg. Co.....40¢55¢

Knives—
 Cast Iron—
 Bird Cage, Sargent's list.....60¢10¢10¢
 Bird Cage, Reading.....60¢10¢10¢
 Clothes Line, Sargent's list.....60¢10¢10¢
 Clothes Line, Reading list.....60¢10¢10¢
 Ceiling, Sargent's list.....55¢10¢10¢
 Harness, Reading list.....55¢10¢10¢
 Coat and Hat, Sargent's list.....55¢10¢10¢
 Coat and Hat, Reading.....50¢10¢50¢10¢10¢
 Cotton.....½ doz 1.25
 Cotton Pat. (N. Y. Mallet & Handle W'ks).....30¢
 Tassel and Picture (T. & S. Mfg. Co.).....30¢
 Wrought Stapler, Hooks, &c.....See Wrought Goods.

Wire—
 Wire Coat and Hat, Gem, list April, 1886.....10¢
 Wire Coat and Hat, Miles.....10¢
 1886.....50¢
 Indestructible Coat and Hat.....45¢
 Wire Coat and Hat, Standard.....45¢
 Belt.....75¢10¢80¢

Miscellaneous—
 Grass, No. 2, 22.00; No. 3, 22.25; No. 4, 22.50
 Nolin's Grass.....½ doz 22.25
 Rush.....55¢60¢
 Whiffletree—Patent.....55¢
 Hooks and Eyes—Malleable Iron.....70¢70¢10¢
 Hooks and Eyes—Brass.....60¢10¢10¢
 Fish Hooks, American.....60¢
 Bench Hooks.....See Bench Stops.

Horse Nails—
 Nos. 6 7 8 9 10
 Ausable.....28¢ 26¢ 25¢ 24¢ 23¢
 Clinton, Fin. 24¢ 22¢ 21¢ 20¢ 19¢
 Essex.....28¢ 26¢ 25¢ 24¢ 23¢
 Lyras.....25¢ 23¢ 22¢ 21¢ 20¢
 Snowden.....25¢ 23¢ 22¢ 21¢ 20¢
 Putnam.....23¢ 21¢ 20¢ 19¢ 18¢
 Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢
 Northwest'n.....25¢ 23¢ 22¢ 21¢ 20¢
 Globe.....23¢ 21¢ 20¢ 19¢ 18¢
 Boston.....23¢ 21¢ 20¢ 19¢ 18¢
 A. C.....25¢ 23¢ 22¢ 21¢ 20¢
 C. B. K.....25¢ 23¢ 22¢ 21¢ 20¢
 Champlain.....28¢ 26¢ 25¢ 24¢ 23¢

Lines—
 Cotton and Linen Fish, Draper's.....50¢
 Draper's Chalk.....60¢
 Draper's Mason's Linen, 84 ft., No. 1, 1.25; No. 2, 1.75; No. 3, 2.25; No. 4, 2.75; No. 5, 3.25.....25¢
 Cotton Chalk.....55¢10¢
 Samson, Cotton, No. 4, 2¢; No. 1½, 2.50; No. 1, 3.00; No. 2, 3.50; No. 3, 4.00; No. 4, 4.50; No. 5, 5.00; No. 6, 5.50; No. 7, 6.00; No. 8, 6.50; No. 9, 7.00; No. 10, 7.50; No. 11, 8.00; No. 12, 8.50; No. 13, 9.00; No. 14, 9.50; No. 15, 10.00; No. 16, 10.50; No. 17, 11.00; No. 18, 11.50; No. 19, 12.00; No. 20, 12.50; No. 21, 13.00; No. 22, 13.50; No. 23, 14.00; No. 24, 14.50; No. 25, 15.00; No. 26, 15.50; No. 27, 16.00; No. 28, 16.50; No. 29, 17.00; No. 30, 17.50; No. 31, 18.00; No. 32, 18.50; No. 33, 19.00; No. 34, 19.50; No. 35, 20.00; No. 36, 20.50; No. 37, 21.00; No. 38, 21.50; No. 39, 22.00; No. 40, 22.50; No. 41, 23.00; No. 42, 23.50; No. 43, 24.00; No. 44, 24.50; No. 45, 25.00; No. 46, 25.50; No. 47, 26.00; No. 48, 26.50; No. 49, 27.00; No. 50, 27.50; No. 51, 28.00; No. 52, 28.50; No. 53, 29.00; No. 54, 29.50; No. 55, 30.00; No. 56, 30.50; No. 57, 31.00; No. 58, 31.50; No. 59, 32.00; No. 60, 32.50; No. 61, 33.00; No. 62, 33.50; No. 63, 34.00; No. 64, 34.50; No. 65, 35.00; No. 66, 35.50; No. 67, 36.00; No. 68, 36.50; No. 69, 37.00; No. 70, 37.50; No. 71, 38.00; No. 72, 38.50; No. 73, 39.00; No. 74, 39.50; No. 75, 40.00; No. 76, 40.50; No. 77, 41.00; No. 78, 41.50; No. 79, 42.00; No. 80, 42.50; No. 81, 43.00; No. 82, 43.50; No. 83, 44.00; No. 84, 44.50; No. 85, 45.00; No. 86, 45.50; No. 87, 46.00; No. 88, 46.50; No. 89, 47.00; No. 90, 47.50; No. 91, 48.00; No. 92, 48.50; No. 93, 49.00; No. 94, 49.50; No. 95, 50.00; No. 96, 50.50; No. 97, 51.00; No. 98, 51.50; No. 99, 52.00; No. 100, 52.50; No. 101, 53.00; No. 102, 53.50; No. 103, 54.00; No. 104, 54.50; No. 105, 55.00; No. 106, 55.50; No. 107, 56.00; No. 108, 56.50; No. 109, 57.00; No. 110, 57.50; No. 111, 58.00; No. 112, 58.50; No. 113, 59.00; No. 114, 59.50; No. 115, 60.00; No. 116, 60.50; No. 117, 61.00; No. 118, 61.50; No. 119, 62.00; No. 120, 62.50; No. 121, 63.00; No. 122, 63.50; No. 123, 64.00; No. 124, 64.50; No. 125, 65.00; No. 126, 65.50; No. 127, 66.00; No. 128, 66.50; No. 129, 67.00; No. 130, 67.50; No. 131, 68.00; No. 132, 68.50; No. 133, 69.00; No. 134, 69.50; No. 135, 70.00; No. 136, 70.50; No. 137, 71.00; No. 138, 71.50; No. 139, 72.00; No. 140, 72.50; No. 141, 73.00; No. 142, 73.50; No. 143, 74.00; No. 144, 74.50; No. 145, 75.00; No. 146, 75.50; No. 147, 76.00; No. 148, 76.50; No. 149, 77.00; No. 150, 77.50; No. 151, 78.00; No. 152, 78.50; No. 153, 79.00; No. 154, 79.50; No. 155, 80.00; No. 156, 80.50; No. 157, 81.00; No. 158, 81.50; No. 159, 82.00; No. 160, 82.50; No. 161, 83.00; No. 162, 83.50; No. 163, 84.00; No. 164, 84.50; No. 165, 85.00; No. 166, 85.50; No. 167, 86.00; No. 168, 86.50; No. 169, 87.00; No. 170, 87.50; No. 171, 88.00; No. 172, 88.50; No. 173, 89.00; No. 174, 89.50; No. 175, 90.00; No. 176, 90.50; No. 177, 91.00; No. 178, 91.50; No. 179, 92.00; No. 180, 92.50; No. 181, 93.00; No. 182, 93.50; No. 183, 94.00; No. 184, 94.50; No. 185, 95.00; No. 186, 95.50; No. 187, 96.00; No. 188, 96.50; No. 189, 97.00; No. 190, 97.50; No. 191, 98.00; No. 192, 98.50; No. 193, 99.00; No. 194, 99.50; No. 195, 100.00; No. 196, 100.50; No. 197, 101.00; No. 198, 101.50; No. 199, 102.00; No. 200, 102.50; No. 201, 103.00; No. 202, 103.50; No. 203, 104.00; No. 204, 104.50; No. 205, 105.00; No. 206, 105.50; No. 207, 106.00; No. 208, 106.50; No. 209, 107.00; No. 210, 107.50; No. 211, 108.00; No. 212, 108.50; No. 213, 109.00; No. 214, 109.50; No. 215, 110.00; No. 216, 110.50; No. 217, 111.00; No. 218, 111.50; No. 219, 112.00; No. 220, 112.50; No. 221, 113.00; No. 222, 113.50; No. 223, 114.00; No. 224, 114.50; No. 225, 115.00; No. 226, 115.50; No. 227, 116.00; No. 228, 116.50; No. 229, 117.00; No. 230, 117.50; No. 231, 118.00; No. 232, 118.50; No. 233, 119.00; No. 234, 119.50; No. 235, 120.00; No. 236, 120.50; No. 237, 121.00; No. 238, 121.50; No. 239, 122.00; No. 240, 122.50; No. 241, 123.00; No. 242, 123.50; No. 243, 124.00; No. 244, 124.50; No. 245, 125.00; No. 246, 125.50; No. 247, 126.00; No. 248, 126.50; No. 249, 127.00; No. 250, 127.50; No. 251, 128.00; No. 252, 128.50; No. 253, 129.00; No. 254, 129.50; No. 255, 130.00; No. 256, 130.50; No. 257, 131.00; No. 258, 131.50; No. 259, 132.00; No. 260, 132.50; No. 261, 133.00; No. 262, 133.50; No. 263, 134.00; No. 264, 134.50; No. 265, 135.00; No. 266, 135.50; No. 267, 136.00; No. 268, 136.50; No. 269, 137.00; No. 270, 137.50; No. 271, 138.00; No. 272, 138.50; No. 273, 139.00; No. 274, 139.50; No. 275, 140.00; No. 276, 140.50; No. 277, 141.00; No. 278, 141.50; No. 279, 142.00; No. 280, 142.50; No. 281, 143.00; No. 282, 143.50; No. 283, 144.00; No. 284, 144.50; No. 285, 145.00; No. 286, 145.50; No. 287, 146.00; No. 288, 146.50; No. 289, 147.00; No. 290, 147.50; No. 291, 148.00; No. 292, 148.50; No. 293, 149.00; No. 294, 149.50; No. 295, 150.00; No. 296, 150.50; No. 297, 151.00; No. 298, 151.50; No. 299, 152.00; No. 300, 152.50; No. 301, 153.00; No. 302, 153.50; No. 303, 154.00; No. 304, 154.50; No. 305, 155.00; No. 306, 155.50; No. 307, 156.00; No. 308, 156.50; No. 309, 157.00; No. 310, 157.50; No. 311, 158.00; No. 312, 158.50; No. 313, 159.00; No. 314, 159.50; No. 315, 160.00; No. 316, 160.50; No. 317, 161.00; No. 318, 161.50; No. 319, 162.00; No. 320, 162.50; No. 321, 163.00; No. 322, 163.50; No. 323, 164.00; No. 324, 164.50; No. 325, 165.00; No. 326, 165.50; No. 327, 166.00; No. 328, 166.50; No. 329, 167.00; No. 330, 167.50; No. 331, 168.00; No. 332, 168.50; No. 333, 169.00; No. 334, 169.50; No. 335, 170.00; No. 336, 170.50; No. 337, 171.00; No. 338, 171.50; No. 339, 172.00; No. 340, 172.50; No. 341, 173.00; No. 342, 173.50; No. 343, 174.00; No. 344, 174.50; No. 345, 175.00; No. 346, 175.50; No. 347, 176.00; No. 348, 176.50; No. 349, 177.00; No. 350, 177.50; No. 351, 178.00; No. 352, 178.50; No. 353, 179.00; No. 354, 179.50; No. 355, 180.00; No. 356, 180.50; No. 357, 181.00; No. 358, 181.50; No. 359, 182.00; No. 360, 182.50; No. 361, 183.00; No. 362, 183.50; No. 363, 184.00; No. 364, 184.50; No. 365, 185.00; No. 366, 185.50; No. 367, 186.00; No. 368, 186.50; No. 369, 187.00; No. 370, 187.50; No. 371, 188.00; No. 372, 188.50; No. 373, 189.00; No. 374, 189.50; No. 375, 190.00; No. 376, 190.50; No. 377, 191.00; No. 378, 191.50; No. 379, 192.00; No. 380, 192.50; No. 381, 193.00; No. 382, 193.50; No. 383, 194.00; No. 384, 194.50; No. 385, 195.00; No. 386, 195.50; No. 387, 196.00; No. 388, 196.50; No. 389, 197.00; No. 390, 197.50; No. 391, 198.00; No. 392, 198.50; No. 393, 199.00; No. 394, 199.50; No. 395, 200.00; No. 396, 200.50; No. 397, 201.00; No. 398, 201.50; No. 399, 202.00; No. 400, 202.50; No. 401, 203.00; No. 402, 203.50; No. 403, 204.00; No. 404, 204.50; No. 405, 205.00; No. 406, 205.50; No. 407, 206.00; No. 408, 206.50; No. 409, 207.00; No. 410, 207.50; No. 411, 208.00; No. 412, 208.50; No. 413, 209.00; No. 414, 209.50; No. 415, 210.00; No. 416, 210.50; No. 417, 211.00; No. 418, 211.50; No. 419, 212.00; No. 420, 212.50; No. 421, 213.00; No. 422, 213.50; No. 423, 214.00; No. 424, 214.50; No. 425, 215.00; No. 426, 215.50; No. 427, 216.00; No. 428, 216.50; No. 429, 217.00; No. 430, 217.50; No. 431, 218.00; No. 432, 218.50; No. 433, 219.00; No. 434, 219.50; No. 435, 220.00; No. 436, 220.50; No. 437, 221.00; No. 438, 221.50; No. 439, 222.00; No. 440, 222.50; No. 441, 223.00; No. 442, 223.50; No. 443, 224.00; No. 444, 224.50; No. 445, 225.00; No. 446, 225.50; No. 447, 226.00; No. 448, 226.50; No. 449, 227.00; No. 450, 227.50; No. 451, 228.00; No.

Molasses Gates—

Stebbin's Pat.	70¢@70¢@71¢
Stebbin's Genuine	60¢@10¢@10¢
Stebbin's Tinned Ends	40¢@10¢
Chase's Hard Metal	50¢@10¢
Bush's	20¢
Lincoln's Pattern	70¢@70¢@10¢
Weed's	20¢@10¢

Boss, per doz:

Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	\$10
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Money Drawers—

Muzzles—	per doz, \$18¢@20¢
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Safety—

per doz, \$3.00, 25¢	
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Nails, see Trade Report.

Wire Nails, Papered.	
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Card June 1, '89, base	\$2.40 @ \$2.50
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Tack Mfrs. list	70¢@10¢
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Wire Nails, Standard Penny.	
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Card June 1, '89, base	\$2.40 @ \$2.50
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Nail Puller—

Curtiss Hammer	per doz \$9.00, 10¢
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Giant, No. 1	per doz \$30.00, 10¢
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Pelican	per doz \$9.00, 25¢
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Boss	per doz \$30.00, 30¢
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Lightning	per doz \$21.00
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Nail Sets—

per gr.	\$4.00 @ \$4.25
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Round	per gr. \$3.25
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Cannon's Diamond Point	per gr. \$12, 20¢
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Nat Crackers—

Table (H. & B. Mfg. Co.)	40¢
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Blake's Pattern	per doz \$2.00, 10¢
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Turner & Seymour Mfg. Co.	50¢
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Nuts—

Nuts, off list Jan. 1, 1888: Square, Hex, Hot Pressed	5.4¢ 5.9¢
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Cold Punched	5.4¢ 5.9¢
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In lots less than 100 lb, add 1/2¢; 1-lb boxes, add 1¢ to list.	
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Oakum—

Government	per lb 7¢ @ 8¢
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U. S. Navy	per lb 6¢ @ 7¢
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Navvies	per lb 5¢ @ 6¢
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Oilers—

Zinc and Tin	65¢ @ 65¢ @ 10¢
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Brass and Copper	60¢ @ 10¢ @ 50¢ @ 10¢ @ 5¢
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Malleable, Hammers' Improved, No. 1	\$3.00; No. 2, \$4.00; No. 3, \$4.40 per doz.
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Malleable, Hammers, Old Pattern, same list	40¢
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Prior's Pat. or "Paragon" Zinc	60¢ @ 10¢ @ 10¢
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Prior's Pat. or "Paragon" Brass	50¢
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Olmetstead's Tin and Zinc	60¢
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Olmetstead's Brass and Copper	50¢
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Broughton's Zinc	60¢
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Broughton's Brass	50¢
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Packing, Steam—

Standard	60¢ @ 10¢ @ 60¢ @ 10¢ @ 10¢
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Extra	60¢ @ 10¢ @ 60¢ @ 10¢ @ 10¢
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N. Y. B. & P. Co. Standard	50¢ @ 10¢ @ 5¢
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N. Y. B. & P. Co. Empire	70¢
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N. Y. B. & P. Co. Salamander	per lb 65¢, 30¢
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Jenkins' Standard	per lb 80¢, 35¢
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Miscellaneous—

American Packing	10¢ @ 11¢ per lb
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Russia Packing	14¢ per lb
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Italian Packing	13¢ @ 14¢ per lb
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Cotton Packing	15¢ @ 17¢ per lb
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Jute	7¢ @ 8¢ per lb
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Padlocks—

See Locks.	
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Pails—

Galvanized Iron—	
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Quarts	10 12 14
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Hill's Light Weight	per doz \$2.75 3.00 3.25
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Hill's Heavy Weight	per doz 3.00 3.25 3.75
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Whiting's	2.75 3.00 3.25
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Sidney Shepherd & Co.	2.80 3.00 3.40
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Iron Clad	2.75 3.00 3.25
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Fire Buckets	2.75 3.25 3.50
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Buckets, see Well Buckets.	
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Indurated Fibre Ware—	
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Star Pails, 12 qt.	per doz \$4.50
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Fire, Stable and Milk, 14 qt.	per doz \$5.85
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Standard Fibre Ware—	
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Per Dozen.	Plain. Dec'd
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Water Pails, 12 qt.	\$4.00 \$4.50
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Dairy Pails, 14 qt.	4.50 5.00
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Fire Pails, No. 1, 12 qt.	5.00
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Fire Pails, No. 2, 14 qt.	4.50
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Pencils—

Faber's Carpenters'	high list 50¢
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Faber's Round Gilt.	per gro \$5.25
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Dixon's Lead	per gro \$4.50
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Dixon's Lumber	per gro \$6.75
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Dixon's Carpenters'	40¢ @ 10¢
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Picks—

Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00.	60¢
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Picture Nails—

Brass Head, Sargent's list.	60¢ @ 10¢ @ 10¢
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Brass Head, Combination list.	50¢ @ 10¢
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Porcelain Head, Sargent's list.	50¢ @ 10¢ @ 10¢
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Porcelain Head, Combination list.	40¢ @ 10¢
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Niles' Patent	40¢
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Pinking Irons—

per doz 65¢ net	
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Pipe, Wrought Iron—

List March 23, 1887.	
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1 1/4 and under, Plain	52 1/2¢
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1 1/4 and under, Galvanized	45¢
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1 1/4 and over, Plain	65¢
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1 1/4 and over, Galvanized	62 1/2¢
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Boiler Tubes, Iron.	
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1 1/4 and under	57 1/2¢
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2 in. to 2 1/2 in.	62 1/2¢
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3 in. and larger	65¢
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Planes and Plane Irons—

Wood Planes—	
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Molding	50¢ @ 50¢ @ 10¢
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Bench, First quality	60¢ @ 60¢ @ 10¢
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Bench, Second quality	60¢ @ 10¢ @ 60¢ @ 10¢ @ 10¢
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Ballie's (Stanley R. & L. Co.)	40¢ @ 10¢
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Iron Planes—	
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Ballie's (Stanley R. & L. Co.)	40¢ @ 10¢
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Miscellaneous Planes (Stanley R. & L. Co.)	40¢ @ 10¢
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Victor Planes (Stanley R. & L. Co.)	20¢ @ 10¢
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Steer's Iron Planes	35¢ @ 35¢ @ 5¢
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Meriden Mal. Iron Co.'s	30¢ @ 10¢ @ 30¢ @ 10¢ @ 10¢
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Davis's Iron Planes	30¢ @ 10¢ @ 30¢ @ 10¢ @ 10¢
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Birmingham Plane Co.	50¢ @ 50¢ @ 5¢
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Gage Tool Co.'s Self-Setting	20¢ @ 10¢
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Chaplin's Iron Planes	40¢ @ 40¢ @ 5¢
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Sargent's	30¢ @ 10¢ @ 30¢ @ 10¢ @ 10¢
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Plane Irons—

Plane Irons	20¢ @ 10¢
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Plane Irons, Butcher's	\$5.00 @ \$5.25 to 2¢
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Plane Irons, Buck Bros.	30¢
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Plane Irons, Auburn Tool Co., "The title"	40¢
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Sandusky Tool Co.	40¢
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Single and Cut.	30¢
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Double	40¢
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L. & J. White	25¢
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Pliers and Nippers—

Butt's Patent	30¢ @ 10¢ @ 40¢
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Hall's No. 2, 5 in.	\$13.50; No. 4, 7 in.
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\$21.00 per doz	20¢ @ 10¢ @ 30¢ @ 10¢
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Humason & Beckley Mfg. Co.	50¢ @ 60¢ @ 10¢
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Gas Pliers	60¢
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Gas Pliers, Custar's Nickel Plated	80¢ @ 5¢
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Eureka Pliers and Nippers	40¢
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Russell's Parallel	25¢
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P. S. & W. Cast Steel	50¢
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P. S. & W. Tinner's Cutting Nippers	50¢
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Carew's Pat. Wire Cutters	20¢
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Morrill's Parallel	per doz \$12.00, 30¢ @ 5¢
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Cronk's 8 in.	\$15.00; 10 in. \$21.00, 40¢ @ 40¢ @ 5¢
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Plumbs and Levels—

Regular List	70¢ @ 10¢ @ 70¢ @ 10¢ @ 10¢
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Diston's	45¢ @ 10¢
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Pocket Levels	70¢ @ 10¢ @ 70¢ @ 10¢ @ 10¢
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Davis Iron Levels	30¢
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Davis' Inclination	10¢ @ 10¢
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Polish, Metal—

Prestolline	20¢ @ 10¢
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Kretolline Paste	33¢ @ 5¢
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Gaston's Silver Compound	33¢ @ 5¢
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Pokes, Animal—

Bishop's O. L.	per doz \$6.50
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Bishop's O. K.	per doz \$5.50
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Bishop's Pioneer	per doz \$3.75
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Bishop's American	per doz \$3.00
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Poppers, Corn—

Round or Square, 1 qt.	per gr \$12.00 @ 15.00
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Round or Square, 2 qt.	per gr \$25.00 @ 20.00
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Post Hole and Tree Augers and Diggers—

Samson Post Hole Digger	per doz \$36.00, 25¢ @ 10¢
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Fletcher Post Hole Augers	per doz \$36, 20¢
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Eureka Diggers	per doz \$16.00 @ 17.00
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Leed's	per doz \$8.00 @ 9.00
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Vaughan's Post Hole Auger	per doz \$13.00 @ 14.00
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Kohler's Little Giant	per doz \$18.00
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Kohler's Hercules	per doz \$15.00
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Kohler's New Champion	per doz \$9.00
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Schneider	per doz \$18.00
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Ryan's Post Hole Diggers	per doz \$24.00
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Cronk's Post Bars	per doz \$60.00
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Gibbs Post Hole Digger	per doz \$30.00, 50¢
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Imperial	per doz \$15, 40¢
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Potato Parers—

White Mountain	per doz \$5.00 @ 5.50
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Machine—
Flat Head, Iron.....55¢
Round Head, Iron.....50¢

Bench and Hand—
Bench, Iron.....55¢10¢55¢10¢10¢
Bench, Wood, Beech.....50¢ doz \$2.25
Bench, Wood, Hickory.....20¢10¢
Hand, Wood.....25¢10¢25¢10¢5¢
Lag, Blunt Point.....75¢75¢10¢
Coach and Lag, Gimlet Point.....75¢
Bed.....25¢5¢
Hand Rail, Sargent's.....60¢10¢
Hand Rail, H. & B. Mfg. Co.....70¢10¢75¢
Hand Rail, Am. Screw Co.....75¢
Jack Screws, Millers Falls list.....50¢50¢5¢
Jack Screws, P. S. & W.....35¢
Jack Screws, Sargent.....60¢10¢60¢10¢5¢
Jack Screws, Stearns.....40¢40¢10¢

Scroll Saws—
Lester, complete, \$10.00.....25¢
Rogers, complete, \$4.00.....25¢
Barnes' Builders' and Cabinet Makers'.....15¢
Barnes' Scroll Saw Blades.....35¢

Scythe Snaths..... 50¢2¢

Shears—

American (Cast) Iron.....75¢10¢75¢10¢5¢
Pruning.....See Pruning Hooks and Shears.
Barnard's Lamp Trimmers.....50¢ doz \$3.75
Tinners.....20¢2¢
Seymour's, List, Dec. 1881.....60¢10¢60¢10¢10¢5¢
Helmich's, List, Dec. 1881.....60¢10¢10¢60¢10¢10¢5¢
Helmich's Tailor's Shears.....33¢4¢
First quality C. S. Trimmers.....80¢80¢10¢
Second quality C. S. Trimmers.....80¢10¢80¢10¢10¢

Acme Cast Shears.....10¢10¢
Diamond Cast Shears.....10¢
Clippers.....10¢10¢
Victor Cast Shears.....75¢10¢75¢10¢5¢
Howe Bros. & Hulbert, Solid Forged Steel.....60¢
Chicago Drop Forge & F. Co., Solid Steel Forged.....70¢
Clausen Shear Co., Japanned.....70¢
Clausen Shear Co., Nickel, same list.....60¢

Sheaves—

Sliding Door—
M. W. Co., list July, 1888.....50¢10¢60¢5¢
R. & E., list Dec. 18, 1885.....55¢20¢
Corbin's list.....60¢10¢25¢
Patent Roller.....60¢10¢25¢
Patent Roller, Hatfield's.....75¢
Russell's Anti-Friction, list Dec. 18, 1885.....60¢2¢
Moore's Anti-Friction.....50¢

Sliding Shutter—
R. & E., list Dec. 18, 1885.....60¢10¢2¢
Sargent's list.....60¢10¢
Reading list.....60¢10¢10¢

Ship Tools—

L. & J. White.....20¢5¢
Albertson Mfg. Co.....25¢

Shoes, Horse, Mule, &c.—

Horse—
Burden's, Perkins', Phoenix, at factory.....\$4.00

Mule—
Add 1¢ per keg to above prices.

Or, Wrought—

Ton lots.....\$10 9¢
1000 lb lots.....\$10 9¢
500 lb lots.....\$10 9¢

Shot—

(Eastern prices 2¢ off, cash, 5 days.)
Drop, 7 bag, 5 lb.....\$1.16
Drop, 7 bag, 5 lb.....\$1.16
Buck and Chilled, 7 bag, 5 lb.....1.41
Buck and Chilled, 7 bag, 5 lb......34

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20¢
Note—Jobbers frequently give 5¢ 7½¢ extra on above.

Griffith's Black Iron.....50¢10¢
Griffith's C. S.....60¢60¢10¢
Griffith's Solid C. S. R. R. Goods.....20¢
Old Colony (Sanford) Fork & Tool Co.....20¢
St. Louis Shovel Co.....20¢60¢7½¢
Hussey, Blinn & Co.....15¢25¢
Hubbard & Co.....20¢20¢7½¢
Lehigh Mfg. Co.....50¢10¢
Payne Pettibone & Son, list January, 1886.....30¢

Remington's (Lowman's) Pat. 80¢10¢40¢
Rowland's, Black Iron.....50¢10¢
Rowland's, Steel.....60¢5¢60¢10¢

Shovels and Tongs—

Iron Head.....60¢10¢60¢10¢5¢
Brass Head.....60¢10¢10¢

Skins, Thimble—

Western list.....75¢5¢75¢10¢
Columbus Wrt. Steel, list Nov. 1, 1887, 30¢
Coldbrookdale Iron Co.....60¢10¢
Utica P. S. T. Skins.....60¢
Utica Turned and Fitted.....35¢

Sieves—

Buffalo Metallic, S. S. & Co.....50¢25¢10¢
Shaker (Barler's Pat.) Flour Sifters.....50¢ doz \$2.00

Electric.....\$18.00
Hunter's.....\$21.00
Smith's Adjustable Sifters.....\$22.00
Smith's Adjustable Milk Strainer.....\$22.00

Smith's Adjustable T. & C. Strainer.....\$12.25

Sieves, Wooden Rim—

Mesh 18, Nested, 70¢ doz.....\$1.00
Mesh 20, Nested, 85¢ doz.....\$1.00
Mesh 24, Nested, 100¢ doz.....1.10

Slates—

School, by case.....40¢

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.).....65¢
Fitch's (Bristol).....60¢10¢
Hotchkiss.....10¢
Andrews.....50¢
Sargent's Patent Guarded.....70¢10¢10¢
German, new list.....40¢10¢
Covert.....50¢2¢
Covert, New Patent.....50¢5¢2¢
Covert, New R. E.....60¢2¢
Covered Springs.....60¢10¢10¢

Soldering Irons—

Covert's Adjustable, list Jan. 1, 1886.....35¢25¢

Spoke Shaves—

Iron.....45¢
Wood.....30¢
Bailey's (Stanley R. & L. Co.).....40¢10¢
Stearns.....20¢10¢30¢

Spoke Trimmers—

Bonney's.....50¢ doz \$10.00, 50¢
Ives, No. 1, \$15.00; No. 2, \$12.00 50¢ doz
Douglas.....50¢ doz \$9.00, 20¢

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp, Co.'s list.....70¢10¢
Solid Table and Tea, Cen. Stamp, Co.'s list.....70¢10¢
Buffalo S. S. & Co.....33¢2¢
Silver-Plated—(4 mos. or 5¢ cash 30 days)

Meriden Brit. Co., Rogers.....50¢
C. Rogers & Bros.....50¢
Rogers & Bro.....50¢
Reed & Barton.....50¢
Wm. Rogers Mfg. Co.....50¢10¢60¢
Holmes & Edwards Silver Co.....50¢10¢
L. Boardman & Son.....50¢10¢

Miscellaneous—

Holmes & Edwards Silver Co.....50¢10¢
No. 30 Silver Metal.....50¢10¢
No. 24 German Silver.....50¢10¢
No. 50 Nickel Silver.....50¢10¢
No. 49 Nickel Silver.....50¢10¢
German Silver.....50¢50¢5¢
German Silver, Hall & Elton.....50¢5¢ cash
Nickel Silver.....50¢50¢50¢10¢5¢ cash
Britannia.....50¢

Boardman's Nickel Silver.....50¢
Boardman's Britannia Spoons, case, lots.....60¢

Springs—

Elliptic, Concord, Platform and Half Scroll.....60¢60¢5¢
Cliff's Bolster Springs.....25¢

Squares—

Steel and Iron.....75¢10¢80¢
Nickel-Plated.....80¢10¢60¢10¢
Try Square and T Bevels.....80¢10¢60¢10¢

Disston's Try Square and T Bevels.....45¢10¢
Winterbottom's Try and Miter.....30¢10¢
Starrett's Micrometer Caliper Squares.....25¢

Avery's Flush Bevel Squares.....40¢
Avery's Bevel Protractor.....50¢

Standard Fibre Ware—

Per Dozen Plain, Dec'd

Wash-Basins, 10½ in.....\$2.00 \$2.25
Wash-Basins, 12 in.....2.25 2.75
Keelers, 11¼ in.....4.00 4.50
Cuspidors.....4.00 4.50
Spittoons, "Daisy," 8 in.....4.00 4.50
Half-Peck Measure.....3.50
See also Pails.

Staples—

Fence Staples, Galvanized, Same price as D'V' Wire.
Fence Staples, Plain.....See Trl. Wre.

Steelyards..... 40¢10¢50¢

Stocks and Dies—

Blacksmith's Waterford Goods.....30¢5¢30¢10¢
Butterfield's Goods.....30¢5¢30¢10¢
Lightning Screw Plate.....25¢30¢
Reece's New Screw Plates.....33¢45¢40¢

Stone—

Hindustan No. 1, 3¢; Axe, 3¼¢; Slips No. 1, 4½¢

Sand Stone.....2¢ 2¼¢
Washita Stone, Extra.....\$19.20¢
Washita Stone, No. 1.....\$14.15¢
Washita Stone, No. 2.....\$10.11¢
Washita Slips, No. 1, Extra.....\$36.38¢
Washita Slips, No. 1.....\$24.25¢
Arkansas Stone, No. 1, 4 to 6 in.....\$1.50
Arkansas Stone, No. 1, 6 to 9 in.....\$1.85
Turkey Oil Stone, 4 to 8 in.....\$1.40¢
Turkey Slips.....\$1.00¢1.50¢
Lake Superior Chise.....\$1.31¢
Seneca Stone, Red Paper Brand.....18¢20¢
Seneca Stone, High Ronds.....\$20.25¢
Seneca Stone, Small Whets.....\$24.00¢

Stove Polish—

Joseph Dixon's.....\$6.00 10¢
Gem.....\$4.50 10¢
Gold Medal.....\$6.00 10¢
Mirror.....\$6.00 10¢
Lustro.....\$4.75
Ruby.....\$3.75
Rising Sun, 5 gro lots.....\$5.50
Dixon's Plum-Bag.....\$5.00
Boynton's No. 1 Day, 5 gro.....\$3.00
Parlor Pride Stove Enamel.....\$1.00 gal.....\$2.00
Yates Liquid, 3 3 6 10 gal.....\$2.00
Yates Standard Paste Polish, 10-lb cans.....\$1.50

Jet Black.....\$3.50
Japanese.....\$3.50
Firealide.....\$2.50
Diamond O. K. Enamel.....\$19.00
Bonnell's Liquid Stove Polish.....\$9.00
Bonnell's Paste Stove Polish.....\$8.00
Black Eagle Benzine Paste, 5 and 10 lb cans.....12¢
Black Jack Water Paste, 5 and 10 lb cans.....12¢
Nickel Plate Paste.....\$6.00

Tacks, Brads, &c.—

List, Jan. 2, 1888.—(Note.—Some manufacturers are selling Tacks at slightly higher prices than those named.)

American Iron Carpet.....80¢80¢5¢
Steel Carpet.....80¢80¢5¢
Swedes Iron Carpet.....80¢80¢5¢
American Iron Cut.....75¢75¢10¢
Swedes Iron.....75¢75¢10¢
Swedes Iron, Upholsterers'.....75¢10¢75¢10¢5¢

Tinned Swedes Iron.....75¢10¢75¢10¢5¢
Tinned Swedes Iron, Upholsterers'.....75¢10¢75¢10¢5¢
Gimp and Lace.....75¢10¢75¢10¢5¢
Tinned Gimp and Lace.....75¢10¢75¢10¢5¢
Swedes Iron Trimmers.....75¢10¢75¢10¢5¢
Swedes Iron Miners'.....75¢10¢75¢10¢5¢
Swedes Iron Bill Posters' or Railroad.....75¢10¢75¢10¢5¢

Swedes Steel (Swedes Iron price list).

Copper Tacks.....50¢10¢
Copper Finishing, Trunk and Clout Nails.....50¢10¢
Finishing Nails.....70¢10¢70¢10¢10¢
Trunk and Clout Nails.....70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails.....70¢10¢
Basket Nails.....70¢10¢70¢10¢10¢
Common and Patent Brads, 70¢10¢70¢

Hungarian Nails.....70¢10¢70¢10¢10¢
Chair Nails.....70¢10¢70¢10¢10¢
Zinc Glaziers' Points.....50¢50¢5¢
Clgar Box Nails.....50¢10¢50¢10¢5¢
Picture-Frame Points.....50¢10¢50¢10¢5¢
Looking-Glass Tacks.....50¢10¢50¢10¢5¢
Leathered Carpet.....50¢10¢50¢10¢5¢
Brush Tacks.....50¢10¢50¢10¢5¢
Shoe Finders, List Jan. 2, 1888, 10¢10¢

Living and Saddle Nails, List Jan. 1, 1888.....30¢10¢10¢
Japanned.....30¢10¢10¢
Double-Pointed Tacks.....85¢
Wire Carpet Nails.....50¢10¢
Wire Brads & Nails, see Nails, Wre.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50¢10¢

Tap Borers—

Common and Rind.....20¢10¢
Ive's Tap Borers.....33¢45¢
Enterprise Mfg. Co.....20¢10¢30¢
Clark's.....33¢45¢35¢

Tapes, Measuring—

American.....25¢10¢
Spring.....40¢
Chesterman's, Regular list.....25¢30¢

Thermometers—

Tin Case.....80¢80¢10¢

Thimble Skins—See Skins.

Ties, Bale—Steel

Standard Wire, list.....50¢10¢5¢

Tinners' Shears, &c.—

Shears and Snips (P. S. & W.).....20¢25¢
Punches, see Punches.
Snips, J. Mallinson & Co.....33¢45¢

Tinware—

Stamped, Japanned and P'ced, list Jan. 20 1887.....75¢75¢5¢

Tire Benders, Upsetters, &c—

Stoddard's Lightning Tire Upsetters.....15¢
Detroit Perfected Tire Bender.....15¢

Tobacco Cutters—

Champion.....20¢10¢30¢
Wood Bottom.....\$5.00 \$5.25
All Iron.....\$4.25
Nashua Lock Co.'s \$18.00 50¢55¢
Wilson's.....55¢
Sargent's.....\$24.55¢10¢
Acme.....\$20.00, 40¢

Transom Lifters—

Wollensak's.....50¢
Class 3 and 4, Bronzed Iron.....25¢
Class 3 and 4, Bronze Metal.....25¢
Skylight Lifters.....35¢
Crown, Eagle and Shield.....50¢
Reiter's, list Jan. 1, 1887.....50¢10¢2¢
Bronzed Iron Rods or Nickel Plate.....30¢
Excelsior.....50¢10¢2¢
Shaw's.....50¢10¢
Payson's Universal.....40¢40¢10¢

Traps—

Game—

Newhouse.....35¢40¢5¢
Nedra Pattern.....70¢70¢5¢
Game, Blake's Patent.....40¢10¢5¢

Mouse and Rat—

Mouse Wood Choker, 7 doz holes, 11¢12¢
Mouse, Round Wire.....\$1.50 10¢
Mouse, Cage, Wire.....\$2.50 10¢
Mouse, Catch-tem-alive.....\$2.50 15¢
Mouse, Bonanza.....\$15.00
Mouse Delusion.....\$15.00
Rat, Decoy.....\$10.00 10¢
Ideal.....\$10.00
Cyclone.....\$5.25
Hotchkiss Metallic Mouse, 5-hole traps, 7 doz 90¢
In full cases.....\$7.50

Trowels—

Lothrop's Brick and Plastering.....25¢
Reed's Brick and Plastering.....15¢
Disston's Brick and Plastering.....25¢25¢10¢
Peace's Plastering.....25¢
Clement & Maynard's.....20¢
Rose's Brick.....15¢20¢
Brade's Brick.....25¢
Worrall's Brick and Plastering.....20¢
Garden.....70¢

Triers—

Butter and cheese.....25¢

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list, '82.....40¢

Tubes, Boiler—

See Pipe.

Twine—

Flax Twine.....BC. B.
No. 9, ¼ and ½ Balls.....22¢ 30¢
No. 12, ¼ and ½ Balls.....21¢ 30¢
No. 18, ¼ and ½ Balls.....18¢ 28¢
No. 24, ¼ and ½ Balls.....18¢ 28¢
No. 36, ¼ and ½ Balls.....16¢ 27¢
No. 28, Mattress, ¼ and ½ Balls.....48¢50¢
Chalk Line, Cotton, ¼ B Balls.....25¢
Mason Line, Linen, ¼ B Balls.....55¢
2-Ply Hemp, ¼ and ½ B Balls (Spring Twine).....11¢
3-Ply Hemp, 1 B Balls.....12¢12¼¢
3-Ply Hemp, 1½ B Balls.....11¢11¼¢
Cotton Wrapping, 5 Balls to lb.....15¢16¢
2, 3, 4 and 5-Ply Jute, ½ B Balls.....10¢
Paper.....6¢6½¢
Cotton Mops, 6, 9, 12 and 15 lb to doz.....18¢

Vises—

Solid Box.....60¢60¢5¢

Parallel—

Fisher & Norris Double Screw.....15¢10¢
Stephens.....25¢30¢
Parker's.....20¢25¢
Wilson's.....55¢
Howard's.....40¢
Bonney's.....40¢10¢
Millers Falls.....40¢40¢10¢
Trenton.....40¢50¢40¢10¢
Merrill's.....15¢20¢
Sargent's.....60¢10¢10¢
Backus and Union.....40¢
Double Screw Leg.....15¢10¢
Prentiss.....20¢25¢
Simpson's Adjustable.....20¢
Moore's.....20¢

Save Filers—

Bonney's, Nos. 2 & 3, \$15.00.....40¢10¢
Stearns.....35¢40¢10¢30¢40¢10¢
Stearns' Silent Saw Vises.....35¢40¢35¢
Sargent's.....\$17.50, 10¢
Hopkins.....40¢10¢
Reading.....40¢10¢
Wentworth.....20¢10¢
Combination Hand Vises.....\$42.00
Cowell Hand Vises.....20¢
Bauer's Pipe Vises.....10¢

Wagon Boxes—

Per D.....2½¢

Wagon Jacks—

Daisy.....25¢

Washer Cutters—

Smith's Pat.....\$12.00, 20¢10¢10¢
Johnson's.....\$11.00, 33¢45¢
Penny's, 7 doz Pol. \$14; Jap'd, \$16.00, 55¢
Appleton's.....\$16.00, 60¢10¢
Bonney's.....30¢10¢

Washers—

Size.....½ 5-16 ¾ 1 1 1 1
Washers.....7 5¼ 4¾ 3¾ 3¼ 3¼ 3¼
In lots less than 200 lb, 5¢ lb, add ¼¢, 5-b boxes 1¢ to list.

Wedges—

Iron.....\$3½¢
Steel.....\$4 ¼¢

Well Buckets, Galvanized—

Hill's.....\$ doz, 12 qt, \$4.25; 14 qt, \$5.25
Iron Clad.....\$ doz, 14 qt, \$4.25-\$4.50
Whiting's Flat Iron Band.....\$4.25-\$4.50
Whiting's Wired Top.....\$4.00-\$4.25

Well Wheels—

8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25

Wire—

Iron—

Market.....
Br. & Ann., Nos. 0 to 18.....70¢10¢75¢
Cop'd, Nos. 0 to 18.....70¢10¢75¢
Galv., Nos. 0 to 18.....25¢5¢
Tin'd, Tinned list Nos. 0 to 18.....87½¢
Stone.....
Br. and Ann'd, Nos. 10 to 18, 72½¢
72½¢5¢
Bright and Ann'd, Nos. 19 to 26.....75¢5¢
Br. and Ann'd, Nos. 27 to 36, 75¢10¢5¢
Tinned.....70¢70¢10¢
Tinned Broom Wire.....70¢5¢70¢10¢
Galvanized Fence, Nos. 8 and 9.....75¢
Annealed Grape, Nos. 10 to 14.....75¢
Brass, list Jan. 18, 1884.....15¢20¢
Copper, list Jan. 18, 1884.....30¢35¢
Barb Fence.....See Trade Report
Wire on Spools.....65¢
Malin's Steel and Tin'd Wire on Spools.....40¢
Malin's Brass and Cop. Wire on Spools 30¢
Cast Steel Wire.....50¢
Stub's Steel Wire.....\$6.00 to 4, 30¢
Steel Music Wire, Nos. 12 to 30, 55¢ lb
Picture Wire.....New list, 50¢
Barb Wire Safety Guard.....\$1000, \$9.00, 25¢

Wire Clothes Lines, see Lines.

Wire Cloth, Netting, &c.—

Painted Screen Cloth, good quality, 100 sq. ft., \$1.80 to \$1.90
Galvanized Wire Netting.....75¢75¢5¢

Wire Goods—

See Bright Wire Goods.

Wire Rope—

List May 1,

CURRENT METAL PRICES.

JUNE 19, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
3/4 to 2 in. round and square.	1 lb 1.90 @ . . .
1 to 6 in. x 3/4 to 1 in.	1 lb 2.00 @ 2.10
Refined Iron:	
3/4 to 2 in. round and square.	1 lb 2.20 @ 2.30
1 to 4 in. x 3/4 to 1 1/2 in.	1 lb 2.10 @ 2.20
4 1/4 to 6 in. x 3/4 to 1 in.	1 lb 2.20 @ 2.30
1 to 6 in. x 1 1/4 and 5-16	1 lb 2.20 @ 2.30
Rods—3/4 and 1-1/2 round and sq.	1 lb 2.20 @ 2.30
Bands—1 to 6 x 3-16 to No. 12	1 lb 2.20 @ 2.30
"Burden Best" Iron, base price.	1 lb 3.00 @ . . .
Burden's "H. B. & S." Iron, base price.	1 lb 2.80 @ . . .
"Ulster"	1 lb 3.00 @ . . .
Norway Rods	4.00 @ 5.00

Merchant Steel from Store.

Open-Hearth and Bessemer Machinery, Tor Calk, Tire and Sleigh Shoe, base price in small lots.	2 1/2¢
Best Cast Steel, base price in small lots	5¢
Best Cast Steel Machinery, base price in small lots	5¢

Sheet Iron from Store.

Common American.	R. G. Cleaned.
10 to 16	2.75 @ 2.80
17 to 20	2.85 @ 3.00
21 to 24	3.00 @ 3.10
25 and 30	3.20 @ 3.50
27	3.35 @ 3.75
28	3.50 @ 4.00
B. E.	2d qual.
Galv'd, 14 to 20, 1/2 lb.	4.50 @ 4.38
Galv'd, 11 to 24, 1/2 lb.	4.87 1/2 @ 4.75
Galv'd, 25 to 26, 1/2 lb.	5.25 @ 5.12
Galv'd, 27	5.62 1/2 @ 5.48
Galv'd, 28	6.00 @ 5.85
Patent Planchet	1 lb A 10¢ B, 9¢
Russia	1 lb 9 1/4¢ @ 10¢
American Cold Rolled B. B.	1 lb 5¢ @ 7¢
Craig Polished Sheet Steel	1 lb 8¢

English Steel from Store.

Best Cast	1 lb 15¢
Extra Cast	1 lb 16 1/2¢ @ 17¢
Swaged, Cast	1 lb 16¢
Best Double Shear	1 lb 15¢
Blister, 1st quality	1 lb 12¢
German Steel, Best	1 lb 10¢
2d quality	1 lb 9¢
3d quality	1 lb 8¢
Sheet Cast Steel, 1st quality	1 lb 15¢
2d quality	1 lb 14¢
3d quality	1 lb 12 1/2¢

METALS.

Tin.

Banca, Pigs	23¢
Straits, Pigs	22¢
English, Pigs	23 1/2¢
Straits in Bars	23 1/2¢

Tin Plates.

Charcoal Plates.—Bright.	Per box.
Melyn Grade	IC, 10 x 14 . . . \$5.75 @ \$6.00
" "	IC, 12 x 12 . . . 6.00 @ 6.25
" "	IC, 14 x 20 . . . 5.75 @ 6.00
" "	IC, 20 x 28 . . . 12.00 @ 12.50
" "	IX, 10 x 14 . . . 7.25 @ 7.50
" "	IX, 12 x 12 . . . 7.50 @ 7.75
" "	IX, 14 x 20 . . . 7.25 @ 7.50
" "	IX, 20 x 28 . . . 15.00 @ 15.50
" "	DC, 12 1/2 x 17 . . 5.50 @ 5.75
" "	DX, 12 1/2 x 17 . . 7.00 @ 7.25
Call and Grade	IC, 10 x 14 . . . 5.75 @ 6.00
" "	IC, 12 x 12 . . . 6.00 @ 6.25
" "	IC, 14 x 20 . . . 5.75 @ 6.00
" "	IX, 10 x 14 . . . 7.25 @ 7.50
" "	IX, 12 x 12 . . . 7.50 @ 7.75
" "	IX, 14 x 20 . . . 7.25 @ 7.50
Alaway Grade	IC, 10 x 14 . . . 5.00 @ 5.12 1/2
" "	IC, 12 x 12 . . . 5.12 1/2 @ 5.25
" "	IC, 14 x 20 . . . 5.00 @ 5.12 1/2
" "	IC, 20 x 28 . . . 11.00 @ 11.50
" "	IX, 10 x 14 . . . 6.00 @ 6.25
" "	IX, 12 x 12 . . . 6.25 @ 6.50
" "	IX, 14 x 20 . . . 6.00 @ 6.25
" "	IX, 20 x 28 . . . 12.00 @ 12.50
" "	DC, 12 1/2 x 17 . . 4.75 @ 5.00
" "	DX, 12 1/2 x 17 . . 5.75 @ 6.00

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20.	\$4.75 @ \$5.00
10 x 20	7.25 @ 7.50
20 x 28	9.75 @ 10.25
IX, 10 x 14, 14 x 20	5.50 @ 5.75
BY Grade.—IC, 10 x 14, 14 x 20.	4.40 @ 4.60
Charcoal Plates.—Terne.	
Dean Grade.—IC, 14 x 20	\$4.35 @ \$4.62 1/2
20 x 28	8.75 @ 9.25
IX, 14 x 20	5.40 @ 5.62 1/2
20 x 28	11.00 @ 11.37 1/2
Abecarne Grade.—IC, 14 x 20	4.25 @ 4.50
20 x 28	8.45 @ 9.00
IX, 14 x 20	5.25 @ 5.50
20 x 28	10.50 @ 10.80

Tin Boiler Plates.

IXX, 14 x 26	112 sheets . . . \$12.50 @ \$12.75
IXX, 14 x 28	112 sheets . . . 12.75 @
IXX, 14 x 31	112 sheets . . . 14.25 @

Copper.

Duty: Pig, Bar and Ingots, 4¢; Old Copper, 3¢ 1/2 lb. Manufactured (including all articles of which Copper is a component of chief value), 4¢ ad valorem.

Ingot.

"Anchor" Brand	@ 13 1/2¢
" "	@ 12 1/2¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, May 23, 1889, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound.							
			Over 64 oz.	82 to 64 oz.	16 to 82 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		30	50	20	31	22	23	26	28
30		72	30	50	20	31	23	23	29	
36	96		30	20	20	23	24	25	30	
36		96	30	20	21	23	25	25	31	
48	96		30	20	21	24	25	25	31	
48		96	30	20	21	24	26	27	31	
60	96		30	20	21	25	27	27	31	
60		96	30	20	21	25	27	27	31	
84	96		30	21	22	25	31	31		
84		96	30	21	22	25	31	31		
Over 84 in. wide			23	23	25	25	25	25	25	25

All Bath Tub Sheets 16 oz. 14 oz. 12 oz. 10 oz.
Per pound \$0.53 0.35 0.27 0.30

Bolt Copper, 3/4 inch diameter and over, per pound 30¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

14 ounce to square foot and heavier 24¢
12 ounce and up to 14 ounce to square foot 24¢
10 ounce and up to 12 ounce 26¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 8 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each 8¢
Tinning sheets on one side, 30 x 60 each 30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each 15¢

For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each 12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each 12¢

Tinning sheets on one side, other sizes, per square foot 2 1/2¢
For tinning both sides double the above prices.

Planchet Brass and Copper.

14 x 48.
14 and 16 oz. and heavier 30¢ per lb.
12 oz. and lighter 32¢ per lb.
24 x 48 and 30 x 30.
14 and 16 oz. and heavier 37¢ per lb.

Seamless Brass and Copper Tubes.

O. G.	N. G.	3/4	1/2	3/8	1/4	1/8	1/16
8-14	6-12	35	31	28	27	26	22
15	13	36	31	29	28	27	23
16	14	37	32	30	29	28	23
17	15	38	33	31	30	29	24
18	16	39	34	32	30	29	25
19	17	41	35	33	32	31	27
20	18-19	42	37	35	34	33	29
21	20	44	39	37	36	35	32
22	21	46	40	38	37	36	34
23	22	48	42	40	39	38	37
24	23	49	44	42	41	39	39
25	24	51	47	44	43	42	41

Copper, Bronze and Gilding Tube, 2¢ 1/2 lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.)

Above 5-16 inch to 3 inch, inclusive 35¢
Plain, above 3 inch 45¢
Plain, 5-16 inch 46¢
Plain, 1/4 inch 60¢
Plain, 3-16 inch 1.00
Fancy Tubing, Brass, to No. 20, inclusive 43¢
Bronze Tubing, 3¢ 1/2 lb more than Brass.
Discount from list 25 @ 30 %

Roll and Sheet Brass.

Discount from list 25 @ 30 %

High Brass Rods.

Over 1 inch diameter 27¢
1/4 inch to 1 inch diameter, both inclusive 34¢
No. 8 and less than 1/4 inch diameter 36¢
Smaller than No. 8 30¢
Hexagon, Octagon and Square, 2¢ 1/2 lb advance over Round Rods.

Spelter.

Duty: Pig, Bars and Plates, \$1.50 per 100 lb.
Western Spelter 5 1/2¢ @ 6¢
"Bergenport" 5¢ @ 6¢
"Bertha" 7 1/2¢ @ 8¢

Zinc.

Duty: Sheet, 2 1/2¢ per lb.
600 lb casks 6 1/2¢
Per lb 7 1/2¢

Lead.

Duty: Pig, \$2 per 100 lb. Old Lead, 2¢ per lb. Pipe and Sheets, 3¢ per lb.
American 4 1/2¢
Newark 4 1/2¢
Bar 4 1/2¢
Pipe, subject to trade discount 0¢
Tin-Lined Pipe, subject to trade discount 15¢
Block Tin Pipe, subject to trade discount 45¢
Sheet, subject to trade discount 6 1/2¢

Solder.

1/2 @ 1/2 (Guaranteed) 14¢
Extra Wiping 13¢
The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson 15 1/2¢ @ 16¢
Hallett's 14¢ @ 14 1/2¢

Fittings.

Cast Iron Fittings, Black and Galvanized, Standard sizes 70¢-10¢
Cast Iron Fittings, Bushings and Plugs 70¢-10¢
Cast Iron Fittings, Flanges 70¢-10¢
Malleable Iron Bushings 75¢-10¢
Malleable Iron Unions 67 1/2¢
Malleable Iron American Unions 65¢
Wrought-Iron Nipples 70¢-10¢
Wrought-Iron Couplings 70¢
Wrought-Iron Long Screws 70¢
Casing Fittings 60¢
Malleable Iron Fittings 25¢

Valves, Cocks, &c.

Iron Body Valves 70¢
Throttle Valves, Iron Body 70¢
All-Iron Valves 65¢
Compression Gauge Cocks 60¢
Mississippi Gauge Cocks 60¢
Register Gauge Cocks 65¢
Air Cocks and Radiator Air Cocks 65¢
Steam Gauge Cocks 60¢
Oil Cups, Plain, Elbow, new pattern, T and Lever Handle 65¢
Globe Oil Cups 55¢
Common Lubricators 65¢
Lubricators with Air Cocks 65¢
Iron Body Lubricators 60¢
Steam Whistles 65¢
Whistle Valves 65¢
Water Gauges 65¢
Brass Expansion Joints 55¢
Pump Valves 55¢
Soldering Unions 65¢
Soldering Nipples 70¢
Brass Unions (Union Joints) 65¢
Radiator Nipples 60¢
Fuel Pumps 60¢
Oil Pumps 55¢
Self-Acting Air Valves 65¢
Vacuum Valves 55¢
Steam Swing Joints 55¢
Iron Strainers 60¢
Jenkins' Iron Body Valves, except Gate Valves 60¢
Jenkins' All-Iron Valves, except Gate Valves 60¢
Jenkins' Iron Body Gate Valves 55¢
Jenkins' All-Iron Gate Valves 55¢
Iron Cocks, all Iron 65¢
Iron Cocks, with Brass Plugs 65¢
Brass Globe, Angle and Cross Valves 65¢
Brass Globe Valves, Finished 45¢
Brass Globe and Angle Valves, hose outlet 65¢
Brass Garden Hose Valves 60¢
Brass Caps for Hose Valves 60¢
Brass Horizontal, Vertical and Angle Check Valves 65¢
Brass Safety Valves 65¢
Brass Safety Valves, low pressure 65¢
Brass Safety Valves, low pressure, with balance weight 65¢
Brass Butterfly Valves 55¢
Brass Throttle Valves 55¢
Brass Radiator Valves 65¢
Brass Radiator Valves, Jenkins' 65¢
Brass Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves 65¢
Brass Jenkins' Gate Valves 60¢
Brass Steam Cocks 60¢
Brass Gas, Meter and Union Meter Cocks 60¢
Brass Fittings, Rough 60¢
Brass Fittings, Finished 25¢
Brass Bushings 60¢

Plumbers' Brass Work.

Ground Key Work, Rough 60¢
Ground Key Work, Finished 55¢
Compression Work 60¢
Compression Work, Grundy, Heavy Pattern 55¢
Chain Stays 60¢
Iron Boiler Couplings, Ground Face, per set \$1 net
Basin Plugs 60¢
Sink or Bath and Wash Tray Plugs 60¢
Basin Clamps 55¢

FRENCH GLASS.

Per Box 50 feet.

Sizes	Single.			
	1st.	2d.	3d.	4th.
EFH	IEH	FH	HH	BB
25 6 x 8 to 10 x 15	\$10.50	\$9.00	\$8.50	\$8.00
40 11 x 14 to 16 x 24	11.50	10.75	10.25	9.75
50 18 x 22 to 20 x 30	15.50	14.00	13.00	12.50
54 15 x 36 to 24 x 30	16.50	15.00	13.50	13.00
60 36 x 28 to 24 x 36	17.75	16.25	14.75	14.25
70 26 x 36 to 26 x 44	19.00	17.50	15.25	14.75
80 26 x 46 to 20 x 50	21.00	19.50	17.00	16.50
84 30 x 52 to 30 x 54	22.00	20.25	18.00	17.50
90 30 x 56 to 34 x 54	23.00	21.25	19.00	18.50
94 34 x 58 to 34 x 60	24.00	22.75	21.00	20.50
100 36 x 60 to 40 x 60	26.50	24.50	23.00	22.50